581J
GAS HEAT/ELECTRIC COOLING
PACKAGED ROOFTOP
3 to 8.5 NOMINAL TONS

Product Data

Preferred™ SERIES

C10405

ENERGY STAR PARTNER

Puron
the environmentally sound refrigerant

ASHRAE 90.1 COMPLIANT

C10222

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Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations. Replaces: NEW

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bryant®

Heating & Cooling Systems

Your Bryant rooftop unit (RTU) was designed by customers for customers. With “no-strip screw” collars, handled access panels, and more we’ve made your unit easy to install, easy to maintain and easy to use.

Easy to install:

All Preferred Series™ units are field-convertible to horizontal air flow; no special adapter curbs or kits are necessary. Convertible airflow design makes it easy to adjust to unexpected job-site complications. Lighter units make easy replacement. Bryant 3-8.5 ton 581J rooftops fit on existing Bryant curbs dating back to 1989. Also, our large control box gives you room to work and room to mount Bryant accessory controls.

Easy to maintain:

Easy access handles by Bryant provide quick and easy access to all normally serviced components. Our “no-strip” screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit’s metal. Take accurate pressure readings by reading condenser pressure with panels on. Simply remove the black, composite plug, route your gauge line(s) through the hole, and connect them to the refrigeration service valve(s). Now, you can take refrigeration system pressure readings without affecting the condenser airflow.

Easy to use:

The newly designed, master terminal board by Bryant puts all your connections and troubleshooting points in one convenient place, standard. Most low voltage connections are made to the same board and make it easy to find what you’re looking for and easy to access it. Bryant rooftops have high and low pressure switches, a filter drier, and 2” (51mm) filters standard.

Puron™ the environmentally sound refrigerant

ASHRAE 90.1 COMPLIANT

energy ENERGY STAR PARTNER

FEATURES AND BENEFITS

- Single-stage cooling capacity control on 04 to 07 models
- Two-stage cooling capacity control on 08 and 09 models
- SEER up to 15.6
- EER up to 13.0
- IEER's up to 13.0
- Exclusive non-corrosive composite condensate pan in accordance with ASHRAE 62 Standard, sloping design; side or center drain
- Gas efficiencies up to 82%
- Induced draft combustion design
- Redundant gas valve, with up to 2 stages of heating
- Pre-painted exterior panels and primer-coated interior panels tested to 500 hours salt spray protection
- TXV refrigerant metering system on each circuit
- Fully insulated cabinet
- Exclusive IGC solid-state control for on-board diagnostics with LED error code designation, burner control logic and energy saving indoor fan motor delay
- Dedicated 3-5 ton "Low NOx" models available that meet California Air Quality Management NOx requirement of 40 nangram/joule or less. Low NOx models include stainless steel heat exchangers
- Cooling operating range up to 125°F (52°C), and down to 35°F (2°C) standard
- Access panels with easy grip handles
- Innovative , easy starting, no-strip screw feature on unit access panels
- Two-inch disposable return air filters
- Tool-less filter access door
- Belt drive evaporator-fan motor and pulley combinations available on all three phase models
- Electric Drive x13 (5 speed/torque) motor on 04 to 06 models
- New terminal board facilitating simple safety circuit troubleshooting and simplified control box arrangement
- Field Convertible from vertical to horizontal airflow for slab mounting. No special kits required
- Provisions for thru-the-bottom power entry capability as standard
- Single point gas and electric connections
- Full perimeter base rail with built-in rigging adapters and fork truck slots
- Scroll compressors with internal line-break overload protection
- 24-volt control circuit protected with resettable circuit breaker
- Permanently lubricated evaporator-fan motor
- Totally enclosed condenser motors with permanently lubricated bearings
- Low Pressure switch and high-pressure switch protection
- Exclusive IGC anti-cycle protection for gas heat operation
- Solid-state electronic direct spark ignition system
- Flame roll-out safety protector
- Liquid line filter drier on each circuit
- Standard Warranty: 10 yr. aluminized heat exchanger, 15 yr. stainless steel heat exchanger, 5 yr. compressor, 1 yr. parts.

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
5	8	1	J	E	0	6	A	0	7	2	A	0	A	0	A	A	–

Unit Type
581J = Cooling/Gas Heat RTU
Legacy Series w/Puron Refrigerant

Voltage
E = 460–3–60
J = 208/230–1–60
P = 208/230–3–60
T = 575–3–60

Cooling Tons
04 = 3 Ton
05 = 4 Ton
06 = 5 Ton
07 = 6 Ton
08 = 7.5 Ton
09 = 8.5 Ton

Refrig. System/Gas Heat Options
A = 1–Stage Cooling/Nat gas heat
B = 1–Stage Cooling/Low NO_x heat
C = 1–Stage CoolingSS HX
D = 2–Stage Cooling 08–09
F = 2–Stage Cooling/SS HX

Heat Level (Input)
Standard/Stainless Steel
072 = 72,000
115 = 115,000
125 = 125,000
150 = 150,000
180 = 180,000
224 = 224,000

Low NO_x
060 = 60,000
090 = 90,000
120 = 120,000

Coil Options (outdoor–indoor–hail guard)
A = Al/Cu –Al/Cu
B = Precoat Al/Cu – Al/Cu
C = E–coat Al/Cu – Al/Cu
D = E–coat Al/Cu – E–coat Al/Cu
E = Cu/Cu – Al/Cu
F = Cu/Cu – Cu/Cu
M = Al/Cu – Al/Cu – Louvered Hail guards
N = Precoat Al/Cu – Al/Cu – Louvered Hail Guards
P = E coat Al/Cu – Al/Cu – Louvered Hail Guards
Q = E coat Al/Cu – E coat Al/Cu – Louvered Hail Guards
R = Cu/Cu – Al/Cu – Louvered Hail Guards
S = Cu/Cu – Cu/Cu – Louvered Hail Guards

Indoor Fan Options
1 = Standard static option
2 = Medium static option
3 = High static option

Outdoor Air Options
A = None
B = Temp econo w/ baro relief
E = Temp econo w/ baro relief & CO_2
H = Enthalpy econo w/ baro relief
L = Enthalpy econo w/ baro relief & CO_2
Q = Motorized 2 pos damper

Factory Installed Options

Packaging
A – Standard
B – LTL

Design Revision
– – First Revision

TABLE 1 – FACTORY-INSTALLED OPTIONS AND FIELD-INSTALLED ACCESSORIES

CATEGORY	ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Cabinet	Thru–the–base electrical or gas–line connections	X	X
	Hinged access panels	X	
Coil Options	Cu/Cu indoor and/or outdoor coils	X	
	Pre–coated outdoor coils	X	
	Premium, E–coated outdoor coils	X	
Condenser Protection	Condenser coil hail guard (louvered design)	X	X
Controls	Thermostats, temperature sensors, and subbases		X
	RTU–MP open–protocol controller	X	
	Smoke detector (supply and/or return air)	X	
	Time Guard II compressor delay control circuit		X
	Phase Monitor		X
Economizers & Outdoor Air Dampers	EconoMi$er™ IV (for electro–mechanical controlled RTUs)	X	X
	EconoMi$er™2 (for DDC controlled RTUs)	X	X
	Motorized 2 position outdoor–air damper	X	X
	Manual outdoor–air damper (25% and 50%)		X
	Barometric relief[1]	X	X
	Power exhaust		X
Economizer Sensors & IAQ Devices	Single dry bulb temperature sensors[2]	X	X
	Differential dry bulb temperature sensors[2]		X
	Single enthalpy sensors[2]	X	X
	Differential enthalpy sensors[2]		X
	Wall or duct mounted CO_2 sensor[2]		X
	Unit mounted CO_2 sensor[2]	X	
Gas Heat	Propane conversion kit		X
	Stainless steel heat exchanger	X	
	High altitude conversion kit		X
	Flue Shield		X
	Flue Discharge Deflector		X
Indoor Motor & Drive	Multiple motor and drive packages	X	
Low Ambient Control	Winter start kit[3]		X
	Motormaster® head pressure controller[3]		X
Power Options	Convenience outlet (powered)	X	
	Convenience outlet (unpowered)	X	
	Non–fused disconnect	X	
Roof Curbs	Roof curb 14” (356mm)		X
	Roof curb 24” (610mm)		X

NOTES:

1. Included with economizer.
2. Sensors used to optimize economizer performance.
3. See application data for assistance.

FACTORY OPTIONS AND/OR ACCESSORIES

Economizer (dry-bulb or enthalpy)

Economizers save money. They bring in fresh, outside air for ventilation; and provide cool, outside air to cool your building. This is the preferred method of low-ambient cooling. When coupled to CO_2 sensors, economizers can provide even more savings by coupling the ventilation air to only that amount required.

Economizers are available, installed and tested by the factory, with either enthalpy or dry-bulb temperature inputs. There are also models for electromechanical as well as direct digital controllers. Additional sensors are available as accessories to optimize the economizers.

Economizers include gravity controlled, barometric relief equalizes building pressure and ambient air pressures. This can be a cast effective solution to prevent building pressurization.

CO_2 Sensor

Improves productivity and saves money by working with the economizer to intake only the correct amount of outside air for ventilation. As occupants fill your building, the CO_2 sensor detects their presence through increasing CO_2 levels, and opens the economizer appropriately.

When the occupants leave, the CO_2 levels decrease, and the sensor appropriately closes the economizer. This intelligent control of the ventilation air, called Demand Control Ventilation (DCV) reduces the overall load on the rooftop, saving money.

Smoke Detectors

Trust the experts. Smoke detectors make your application safer and your job easier. Bryant smoke detectors immediately shut down the rooftop unit when smoke is detected. They are available, installed by the factory, for supply air, return air, or both.

Louvered Hail Guards

Sleek, louvered panels protect the condenser coil from hail damage, foreign objects, and incidental contact.

Convenience Outlet (powered or un-powered)

Reduce service and/or installation costs by including a convenience outlet in your specification. Bryant will install this service feature at our factory. Provides a convenient, 15 amp, 115v GFCI receptacle with “Wet in Use” cover. The “powered” option allows the installer to power the outlet from the line side of the disconnect or load side as required by code. The “unpowered” option is to be powered from a separate 115/120v power source.

Non-fused Disconnect

This OSHA-compliant, factory-installed, safety switch allows a service technician to locally secure power to the rooftop.

Power Exhaust with Barometric Relief

Superior internal building pressure control. This field-installed accessory may eliminate the need for costly, external pressure control fans.

RTU-MP, Multi-Protocol Controller

Connect the rooftop to an existing BAS without needing complicated translators or adapter modules using the RTU-MP controller. This new controller speaks the 4 most common building automation system languages (Bacnet, Modbus, N2, and Lonworks). Use this controller when you have an existing BAS.

Time Guard II Control Circuit

This accessory protects your compressor by preventing short-cycling in the event of some other failure, prevents the compressor from restarting for 30 seconds after stopping. Not required with RTU-MP or authorized commercial thermostats.

Motorized 2-Position Damper

The new Bryant 2-position, motorized outdoor air damper admits up to 100% outside air. Using reliable, gear-driven technology, the 2-position damper opens to allow ventilation air and closes when the rooftop stops, stopping unwanted infiltration.

Manual OA Damper

Manual outdoor air dampers are an economical way to bring in ventilation air. The dampers are available in 25% and 50% versions.

Hinged Access Panels

Allows access to unit’s major components with specifically designed hinged access panels. Panels are: filter, control box, fan motor and compressor.

FACTORY OPTIONS AND/OR ACCESSORIES (CON'T)

Motormaster Head Pressure Controller

The Motormaster motor controller is a low ambient, head pressure controller kit that is designed to maintain the unit's condenser head pressure during periods of low ambient cooling operation. This device should be used as an alternative to economizer free cooling not when economizer usage is either not appropriate or desired. The Motormaster will either cycle the outdoor-fan motors or operate them at reduced speed to maintain the unit operation, depending on the model.

Winter Start Kit

The winter start kit by Bryant extends the low ambient limit of your rooftop to 25°F (-4°C). The kit bypasses the low pressure switch, preventing nuisance tripping of the low pressure switch. Other low ambient precautions may still be prudent.

Propane Heating

Convert your gas heat rooftop from standard natural gas operation to Propane using this field-installed kit.

High Altitude Heating

High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and maintain healthy combustion at altitudes above 2000 ft (610m). Kits may not be required in all areas.

Flue Discharge Deflector

The flue discharge deflector is a useful accessory when flue gas recirculation is a concern. By venting the flue discharge upwards, the deflector minimizes the chance for a neighboring unit to intake the flue exhaust.

Optional Stainless Steel Heat Exchanger

The stainless steel heat exchanger option provides the tubular heat exchanger be made out of a minimum 20 gauge type 409 stainless steel for applications where the mixed air to the heat exchanger is expected to drop below 45°F (7°C). Stainless steel may be specified on applications where the presence of airborne contaminants require its use (applications such as paper mills) or in area with very high outdoor humidity that may result in severe condensation in the heat exchanger during cooling operation.

Flue Discharge Heat Shield

The flue discharge heat shield keeps people from touching the rooftop unit's potentially hot flue discharge. This is especially useful for ground level applications, where more, untrained people could have access to the unit's exterior.

Alternate Motors and Drives

Some applications need larger horsepower motors, some need more airflow, and some need both. Regardless of the case, your Bryant expert has a factory installed combination to meet your application. A wide selection of motors and pulleys (drives) are available, factory installed, to handle nearly any application.

Thru-the-Base Connections

Thru-the-base connections, available as either an accessory or as a factory option, are necessary to ensure proper connection and seal when routing wire and piping through the rooftop's basepan and curb. These couplings eliminate roof penetration and should be considered for gas lines, main power lines, as well as control power.

TABLE 2 – AHRI COOLING RATING TABLE 1-STAGE COOLING

UNIT	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	SEER	EER	IEER
04A	1	3	36.0	2.9	15.00	12.50	N/A
05A	1	4	48.5	3.7	15.60	13.00	N/A
06A	1	5	57.5	4.6	15.20	12.45	N/A
07A	1	6	73.0	6.0	N/A	12.00	13.00

TABLE 3 – AHRI COOLING RATING TABLE 2-STAGE COOLING

UNIT	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	SEER	EER	IEER
08D	2	7.5	89.0	7.4	N/A	12.00	13.00
09D	2	8.5	97.0	8.1	N/A	12.00	13.00

LEGEND

AHRI – Air Conditioning, Heating and Refrigeration Institute Test Standard
ASHRAE – American Society of Heating, Refrigerating and Air Conditioning, Inc.
EER – Energy Efficiency Ratio
IEER – Integrated Energy Efficiency Ratio
SEER – Seasonal Energy Efficiency Ratio

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

NOTES:

1. Rated in accordance with AHRI Standards 210/240 (04 – 06 size) and 340/360 (07 – 09 size).
2. Ratings are based on:
   Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temp and 95°F (35°C) db outdoor air temp.
   IEER Standard: A measure that expresses cooling part – load EER efficiency for commercial unitary air – conditioning and heat pump equipment on the basis of weighted operation at various load capacities.
3. All 581J units comply with ASHRAE 90.1 2001, 2004 Energy Standard for minimum SEER and EER requirements.
4. 581J units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes or visit the following website: http://bcap – energy.org.

TABLE 4 – HEATING RATING TABLE - NATURAL GAS & PROPANE

Units		Gas Heat	AL/SS HEAT EXCHANGER		TEMP RISE (DEG F)	THERMAL EFFICIENCY (%)	AFUE (%)
			INPUT / OUTPUT STAGE 1 (MBH)	INPUT / OUTPUT STAGE 2 (MBH)			
Single Phase	04	LOW	50 / 41	72 / 59	25 – 55	82%	81%
		MED	82 / 66	115 / 93	55 – 85	80%	80%
		HIGH	–	–	–	–	–
	05	LOW	50 / 41	72 / 59	25 – 55	82%	81%
		MED	82 / 66	115 / 93	35 – 65	81%	80%
		HIGH	120 / 96	150 / 120	50 – 80	80%	80%
	06	LOW	50 / 41	72 / 59	20 – 55	82%	81%
		MED	82 / 66	115 / 93	30 – 65	81%	80%
		HIGH	120 / 96	150 / 120	40 – 80	80%	80%
Three Phase	04	LOW	50 / 41	72 / 59	25 – 55	82%	N/A
		MED	82 / 66	115 / 93	55 – 85	80%	N/A
		HIGH	–	–	–	–	–
	05	LOW	50 / 41	72 / 59	25 – 55	82%	N/A
		MED	82 / 66	115 / 93	35 – 65	81%	N/A
		HIGH	120 / 96	150 / 120	50 – 80	80%	N/A
	06	LOW	50 / 41	72 / 59	20 – 55	82%	N/A
		MED	82 / 66	115 / 93	30 – 65	81%	N/A
		HIGH	120 / 96	150 / 120	40 – 80	80%	N/A
	07	LOW	50 / 41	72 / 59	15 – 55	82%	N/A
		MED	90 / 73	125 / 103	20 – 50	82%	N/A
		HIGH	105 / 84	150 / 120	30 – 60	81%	N/A
	08	LOW	90 / 73	125 / 103	20 – 50	82%	N/A
		MED	120 / 98	180 / 148	35 – 65	82%	N/A
		HIGH	180 / 147	224 / 184	45 – 75	82%	N/A
	09	LOW	90 / 73	125 / 103	20 – 50	82%	N/A
		MED	120 / 98	180 / 148	30 – 65	82%	N/A
		HIGH	180 / 147	224 / 184	40 – 75	82%	N/A

NOTES:

Heat ratings are for natural gas heat exchangers operated at or below 2000 ft (610 m). For information on Propane or altitudes above 2000 ft (610 m), see the Application Data section of this book. Accessory Propane/High Altitude kits are also available.

In the USA the input rating for altitudes above 2000 ft (610m) must be derated by 4% for each 1000 ft (305 m) above sea level. In Canada, the input rating must be derated by 10% for altitudes of 2000 ft (610 m) to 4500 ft (1372 m) above sea level.

TABLE 5 – HEATING RATING TABLE - LOW NO_X[1]

UNIT		GAS HEAT	LOW NOx HEAT EXCHANGER		TEMP RISE (DEG F)	THERMAL EFFICIENCY (%)	AFUE (%)
			INPUT / OUTPUT STAGE 1 (MBH)	INPUT / OUTPUT STAGE 2 (MBH)			
Single Phase	04	LOW	–	60 / 50	20 – 50	81%	80%
		MED	–	90 / 74	30 – 60	81%	81%
		HIGH	–	–	–	–	–
	05	LOW	–	60 / 50	20 – 50	81%	80%
		MED	–	90 / 74	30 – 60	81%	81%
		HIGH	–	120 / 101	40 – 70	81%	80%
	06	LOW	–	60 / 50	15 – 50	81%	80%
		MED	–	90 / 74	25 – 60	80%	81%
		HIGH	–	120 / 101	35 – 70	80%	81%
Three Phase	04	LOW	–	60 / 50	20 – 50	81%	80%
		MED	–	90 / 74	30 – 60	81%	81%
		HIGH	–	–	–	–	–
	05	LOW	–	60 / 50	20 – 50	81%	80%
		MED	–	90 / 74	30 – 60	81%	81%
		HIGH	–	120 / 101	40 – 70	81%	80%
	06	LOW	–	60 / 50	15 – 50	81%	80%
		MED	–	90 / 74	25 – 60	80%	81%
		HIGH	–	120 / 101	35 – 70	80%	81%

NOTE:

1. Units meet California's South Coast Air Quality Management District (SCAQMD) Low–NO_x emissions requirement of 40 nanograms per joule or less.

TABLE 6 – SOUND PERFORMANCE TABLE

UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60								
		A–WEIGHTED	63	125	250	500	1000	2000	4000	8000
04A	1	76	78.2	78.0	74.2	73.3	70.6	66.0	62.4	56.9
05A	1	78	84.7	83.6	77.1	74.6	72.3	68.3	64.7	60.9
06A	1	77	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0
07A	1	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
08D	2	82	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7
09D	2	82	88.6	85.0	81.6	79.5	77.4	74.1	71.0	66.3

LEGEND

dB – Decibel

AHRI CERTIFIED www.ahridirectory.org
Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

NOTES:

1. Outdoor sound data is measure in accordance with AHRI.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A–weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A–weighted measurements for Bryant units are taken in accordance with AHRI.

TABLE 7 – MINIMUM - MAXIMUM AIRFLOW RATINGS - NATURAL GAS & PROPANE

UNIT	HEAT LEVEL	COOLING		HEATING	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
581J*04	LOW	900	1500	990	2190
	MED			1000	1550
	HIGH			–	–
581J*05	LOW	1200	2000	990	2190
	MED			1330	2460
	HIGH			1390	2220
581J*06	LOW	1500	2500	990	2730
	MED			1330	2880
	HIGH			1390	2780
581J*07	LOW	1800	3000	990	3640
	MED			1330	4750
	HIGH			1390	3750
581J*08	LOW	2250	3750	1900	4750
	MED			2100	3900
	HIGH			2270	3780
581J*09	LOW	2550	4250	1900	4750
	MED			2100	4560
	HIGH			2270	4250

TABLE 8 – PHYSICAL DATA (COOLING) 3 - 6 TONS

		581J*04A	581J*05A	581J*06A	581J*07A
Refrigeration System					
	# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll
	Puron® refrig. (R–410A) charge A/B (lbs–oz)	9 – 0	12 – 8	13 – 3	14 – 0
	Metering Device	TXV	TXV	TXV	TXV
	High–press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
	Low–press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117
	Compressor Capacity Staging (%)	100%	100%	100%	100%
Evap. Coil					
	Material (Tube Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
	Rows / FPI	3 / 15	3 / 15	4 / 15	3 / 15
	Total Face Area (ft^2)	5.5	7.3	7.3	8.9
	Condensate Drain Conn. Size	3/4"	3/4"	3/4"	3/4"
Evap. Fan and Motor					
Standard Static 1 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	n/a
	Max BHP	1	1	1	n/a
	RPM Range	600–1200	600–1200	600–1200	n/a
	Motor Frame Size	48	48	48	n/a
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	n/a
	Fan Diameter (in)	10 x 10	10 x 10	11 x 10	n/a
Standard Static 3 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	1 / Belt
	Max BHP	1	1	1	2.4
	RPM Range	600–1200	600–1200	600–1200	1073–1457
	Motor Frame Size	48	48	48	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	10 x 10	10 x 10	11 x 10	10 x 10
Medium Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.2	1.7	2.4	2.9
	RPM Range	770–1175	920–1303	1035–1466	1173–1518
	Motor Frame Size	48	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	10 x 10	10 x 10	10 x 10	10 x 10
High Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.4	2.9	2.9	3.7
	RPM Range	1035–1466	1208–1639	1303–1687	1474–1788
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	10 x 10	10 x 10	10 x 10	10 x 10
Cond. Coil					
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
	Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft^2)	12.7	21.3	21.3	20.5
Cond. fan / motor					
	Qty / Motor Drive Type	1/ Direct	1/ Direct	1/ Direct	2/ Direct
	Motor HP / RPM	1/8 / 825	1/4 / 1100	1/4 / 1100	1/4 / 1100
	Fan diameter (in)	22	22	22	22
Filters					
	RA Filter # / Size (in)	2 / 16 x 25 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2	4 / 16 x 20 x 2
	OA inlet screen # / Size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1

TABLE 9 – PHYSICAL DATA (HEATING) 3 - 6 TONS

	581J*04A	581J*05A	581J*06A	581J*07A
Gas Connection				
# of Gas Valves	1	1	1	1
Nat. gas supply line press (in. w.g.)/(PSIG)	4 –13 / 0.18 – 0.47	4 –13 / 0.18 – 0.47	4 –13 / 0.18 – 0.47	4 –13 / 0.18 – 0.47
Propane supply line press (in. w.g.)/(PSIG)	11 –13 / 0.40 – 0.47	11 –13 / 0.40 – 0.47	11 –13 / 0.40 – 0.47	11 –13 / 0.40 – 0.47
Heat Anticipator Setting (Amps)				
1st stage	0.14	0.14	0.14	0.14
2nd stage	0.14	0.14	0.14	0.14
Natural Gas, Propane Heat				
# of stages / # of burners (total)	1 or 2 / 2	1 or 2 / 2	1 or 2 / 2	2 / 2
LOW Connection size	1/2” NPT	1/2” NPT	1/2” NPT	1/2” NPT
LOW Rollout switch opens / closes	195 / 115	195 / 115	195 / 115	195 / 115
LOW Temperature rise range (F)	25 – 55	25 – 55	20 – 55	15 – 55
# of stages / # of burners (total)	1 or 2 / 3	1 or 2 / 3	1 or 2 / 3	2 / 3
MED Connection size	1/2” NPT	1/2” NPT	1/2” NPT	1/2” NPT
MED Rollout switch opens / closes	195 / 115	195 / 115	195 / 115	195 / 115
MED Temperature rise range (F)	55 – 85	35 – 65	30 – 65	20 – 50
HIGH Connection size	–	1 or 2 / 3	1 or 2 / 3	2 / 4
HIGH # of stages / # of burners (total)	–	1/2” NPT	1/2” NPT	3/4” NPT
HIGH Rollout switch opens / closes	–	195 / 115	195 / 115	195 / 115
HIGH Temperature rise range (F)	–	50 – 80	40 – 80	30 – 60
Low NO_x Gas Heat				
# of stages / # of burners (total)	1 or 2 / 2	1 or 2 / 2	1 or 2 / 2	–
LOW Connection size	1/2” NPT	1/2” NPT	1/2” NPT	–
LOW Rollout switch opens / closes	195 / 115	195 / 115	195 / 115	–
LOW Temperature rise range (F)	20 – 50	20 – 50	15 – 50	–
# of stages / # of burners (total)	1 or 2 / 3	1 or 2 / 3	1 or 2 / 3	–
MED Connection size	1/2” NPT	1/2” NPT	1/2” NPT	–
MED Rollout switch opens / closes	195 / 115	195 / 115	195 / 115	–
MED Temperature rise range (F)	30 – 60	30 – 60	25 – 60	–
				–
# of stages / # of burners (total)	–	1 or 2 / 3	1 or 2 / 3	–
HIGH Connection size	–	1/2” NPT	1/2” NPT	–
HIGH Rollout switch opens / closes	–	195 / 115	195 / 115	–
HIGH Temperature rise range (F)	–	40 – 70	35 – 70	–

TABLE 10 – PHYSICAL DATA (COOLING) 7.5 - 8.5 TONS

		581J*08D	581J*09D
Refrigeration System			
	# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll
	R–410a charge A/B (lbs – oz)	9 – 10 / 9 – 10	9 – 19 / 9 – 14
	Metering device	TXV	TXV
	High–press. Trip / Reset (psig)	630 / 505	630 / 505
	Low–press. Trip / Reset (psig)	54 / 117	54 / 117
	Compressor Capacity Staging (%)	50% / 100%	50% / 100%
Evap. Coil			
	Material (Tube/Fin)	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF
	Rows / FPI	4 / 15	4 / 15
	total face area (ft2)	11.1	11.1
	Condensate drain conn. size	3/4"	3/4"
Evap. fan and motor			
Standard Static 3 phase	Motor Qty / Drive type	1 / Belt	1 / Belt
	Max BHP	1.7	1.7
	RPM range	518–733	518–733
	motor frame size	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	15 x 15	15 x 15
Medium Static 3 phase	Motor Qty / Drive type	1 / Belt	1 / Belt
	Max BHP	2.4	2.4
	RPM range	690–936	690–936
	motor frame size	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	15 x 15	15 x 15
High Static 3 phase	Motor Qty / Drive type	1 / Belt	1 / Belt
	Max BHP	3.7	3.7
	RPM range	838–1084	838–1084
	motor frame size	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	15 x 15	15 x 15
Cond. Coil			
	Material (Tube/Fin)	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF
	Rows / FPI	2 / 17	2 / 17
	Total Face Area (ft^2)	25.1	25.1
Cond. fan / motor			
	Qty / Motor drive type	2 / direct	2 / direct
	Motor HP / RPM	1/4 / 1100	1/4 / 1100
	Fan diameter (in)	22	22
Filters			
	RA Filter # / size (in)	4 / 20 x 20 x 2	4 / 20 x 20 x 2
	OA inlet screen # / size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1

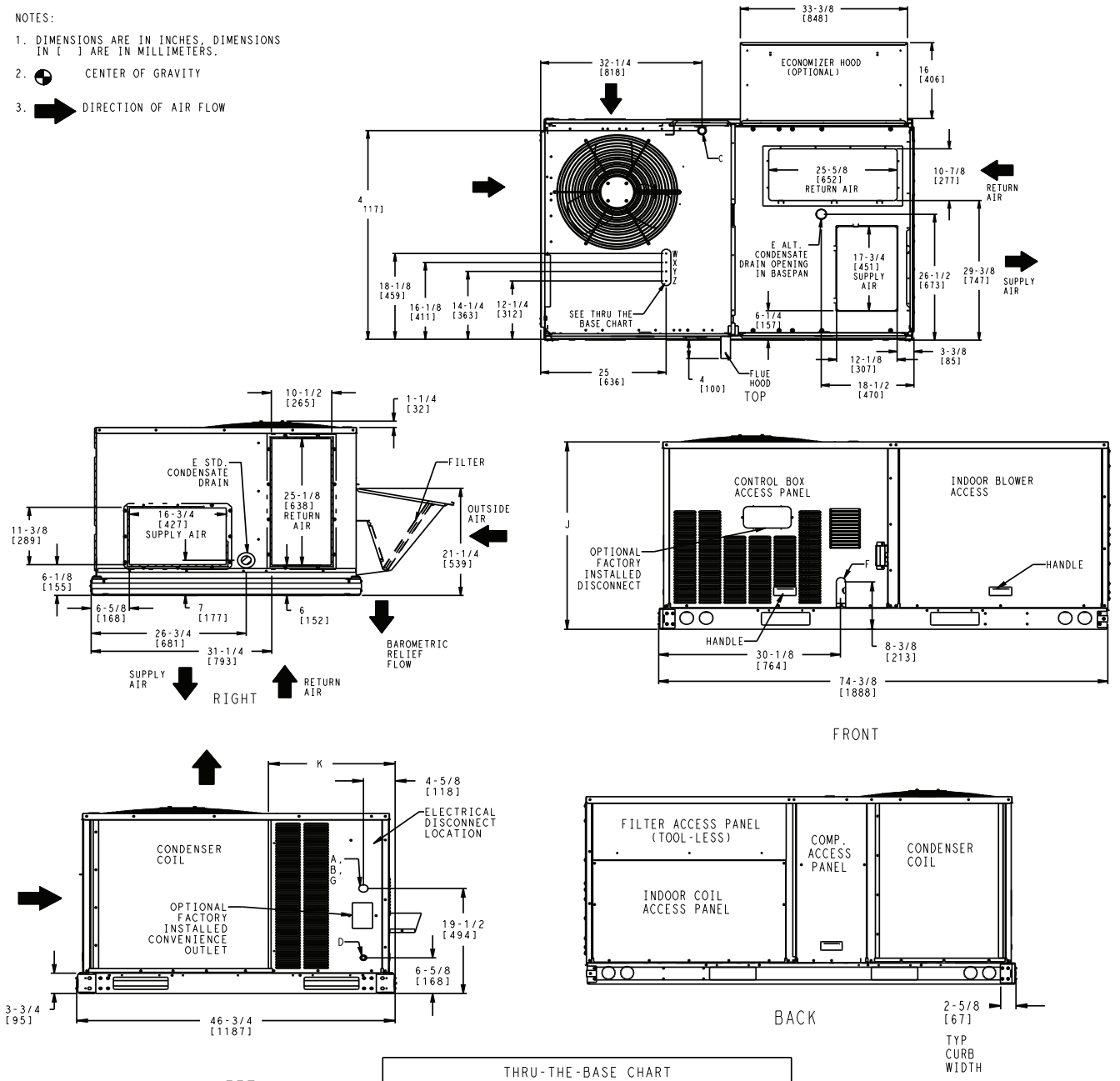
TABLE 11 – PHYSICAL DATA (HEATING) 7.5 - 8.5 TONS

	581J*08D	581J*09D
Gas Connection		
# of Gas Valves	1	1
Nat. gas supply line press (in. w.g.)/(PSIG)	4 –13 / 0.18 – 0.47	4 –13 / 0.18 – 0.47
Propane supply line press (in. w.g.)/(PSIG)	11 –13 / 0.40 – 0.47	11 –13 / 0.40 – 0.47
Heat Anticipator Setting (Amps)		
1st stage	0.14	0.14
2nd stage	0.14	0.14
Natural Gas, Propane Heat		
# of stages / # of burners (total)	2 / 3	2 / 3
LOW Connection size	1/2” NPT	1/2” NPT
LOW Rollout switch opens / closes	195 / 115	195 / 115
LOW Temperature rise range (F)	20 – 50	20 – 50
# of stages / # of burners (total)	2 / 4	2 / 4
MED Connection size	3/4” NPT	3/4” NPT
MED Rollout switch opens / closes	195 / 115	195 / 115
MED Temperature rise range (F)	35 – 65	30 – 65
# of stages / # of burners (total)	2 / 5	2 / 5
HIGH Connection size	3/4” NPT	3/4” NPT
HIGH Rollout switch opens / closes	195 / 115	195 / 115
HIGH Temperature rise range (F)	45 – 75	40 – 75

CURBS & WEIGHTS DIMENSIONS - 581J04-06

NOTES:

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW



	CONNECTION SIZES
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [50] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION
G	2 1/2 " [64] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR001A01, 003A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y *	3/4" (001,003)	POWER	1 1/8" [28.4]
Z**	(003) 1/2" FPT	GAS	1 3/16" [30.0]
	FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X,Y, & Z ARE PROVIDED		
*	SELECT EITHER 3/4" OR 1/2" FOR POWER, DEPENDING ON WIRE SIZE		
**	(001) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING.		

UNIT	J	K
581J-04A	33 3/8 [847]	18 5/8 [472]
581J-05A	41 3/8 [1051]	14 7/8 [377]
581J-06A	41 3/8 [1051]	14 7/8 [377]

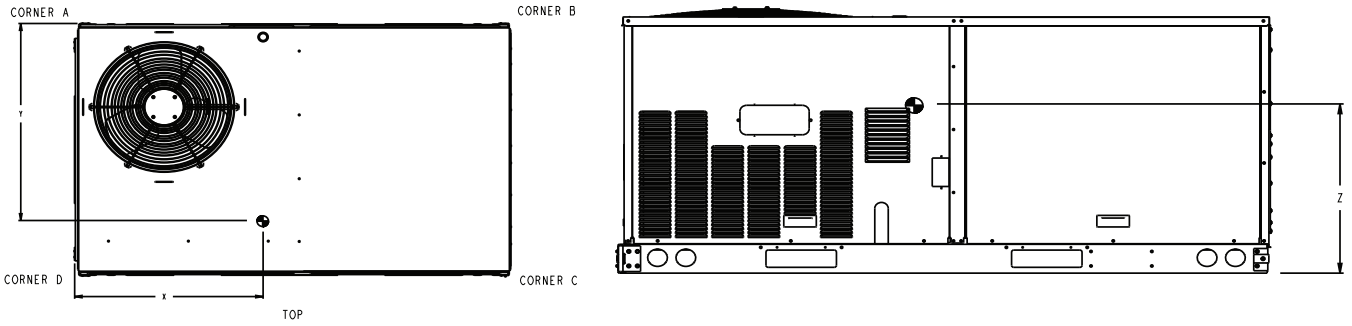
C10378

Fig. 1 - Dimensions 581J04-06

CURBS & WEIGHTS DIMENSIONS - 581J04-06 (cont.)

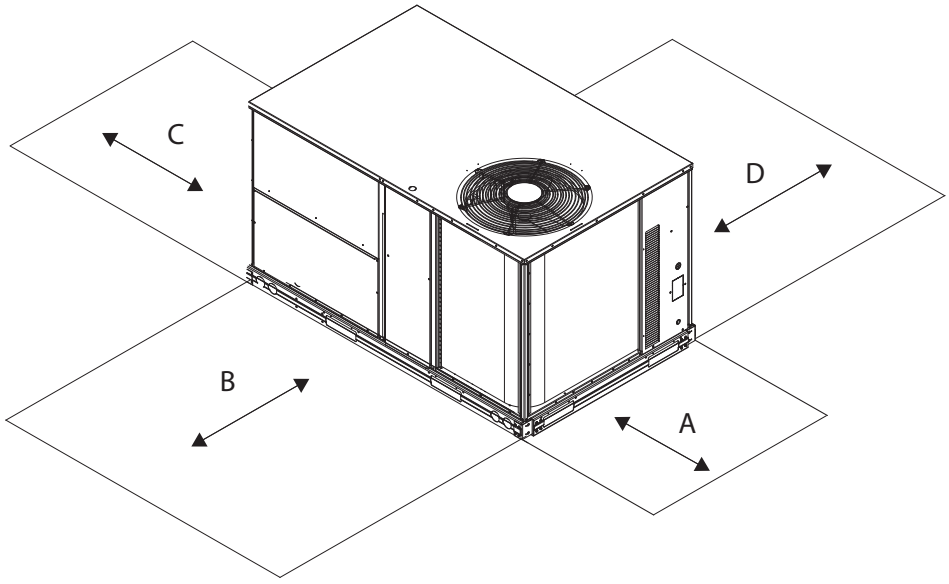
UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
581J-04A	505	229	124	56	117	53	128	58	136	62	36 1/8 [918]	24 3/8 [619]	19 [483]
581J-05A	590	268	151	69	144	65	144	65	151	69	36 1/4 [921]	23 3/8 [594]	20 1/8 [511]
581J-06A	600	271	156	71	145	66	144	65	155	70	35 7/8 [911]	23 1/4 [591]	19 1/2 [495]

*- STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTINS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.



C10379

Fig. 2 - Dimensions 581J04-06



C08337

Fig. 3 - Service Clearance

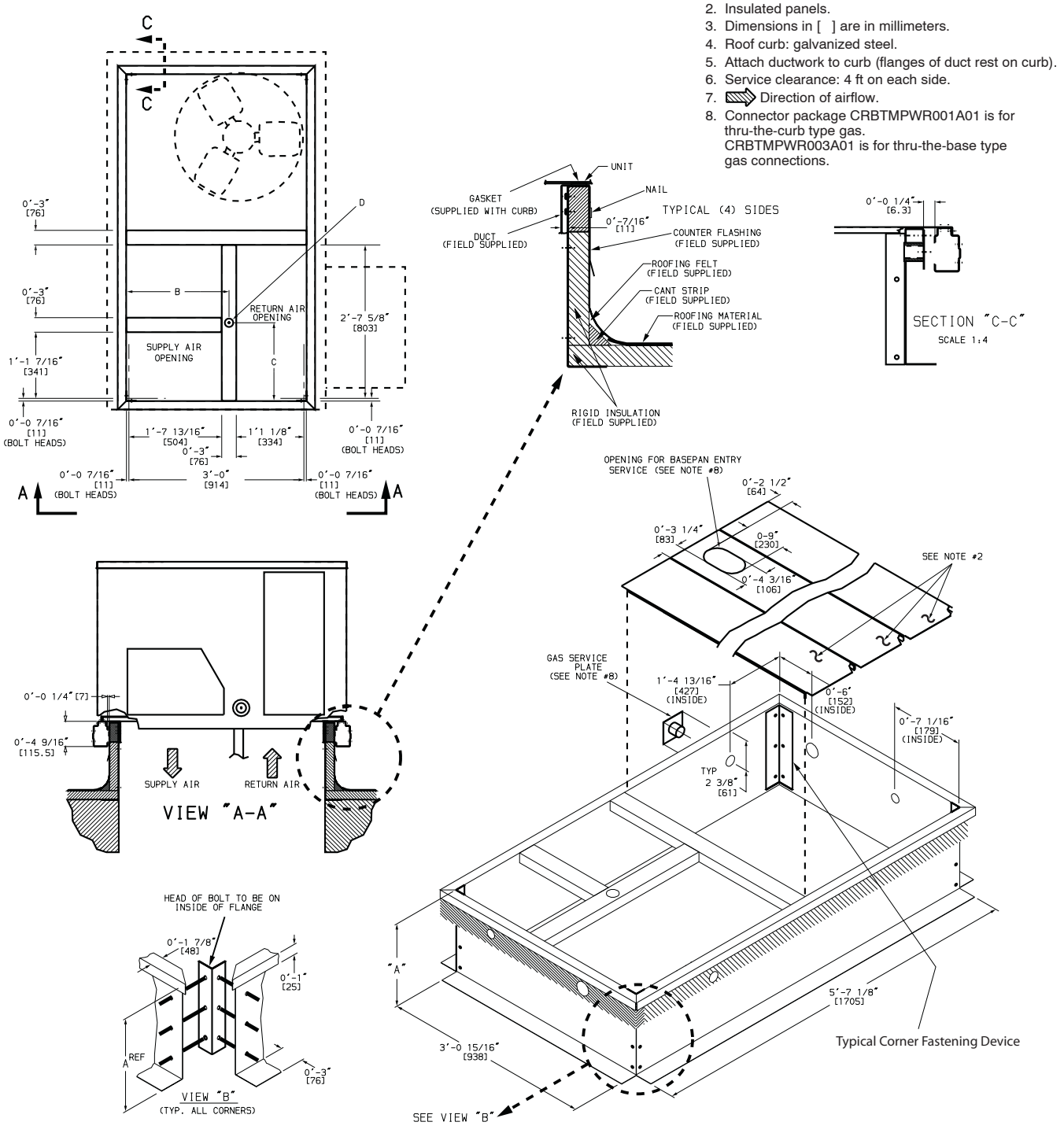
LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance
	12” (305 mm)	Minimum clearance
B	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10–ft of unit fresh air intake hood
C	36” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10–ft of this unit’s flue outlet

CURBS & WEIGHTS DIMENSIONS - 581J04-06 (cont.)

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY POWER
CRBTMPWR001A01	1'-9 11/16" [551]	1'-4" [406]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				1/2" [12.7] NPT			

ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1'-2" [356]	581J*04-06
CRRFCURB002A01	2'-0" [610]	

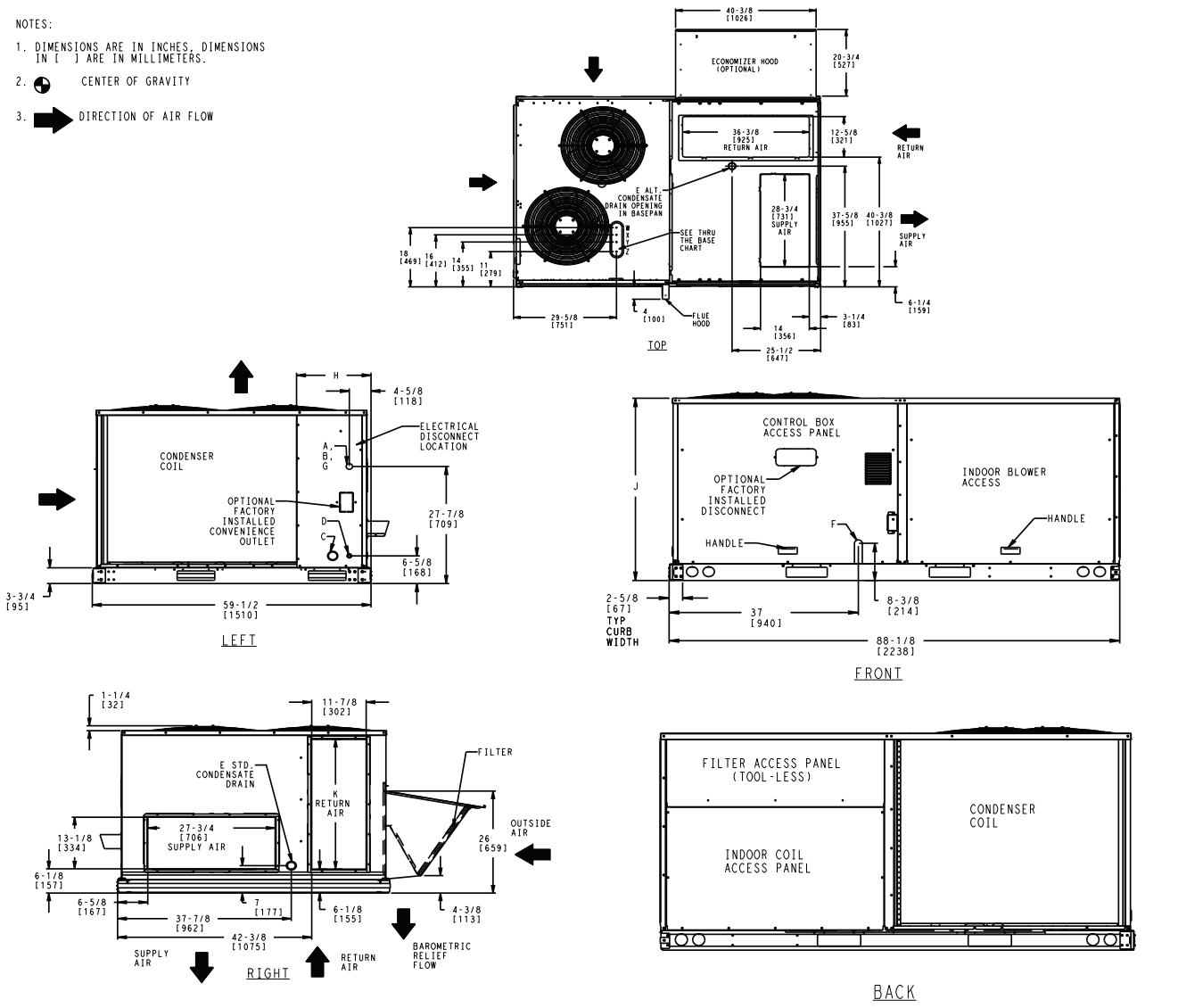
NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance: 4 ft on each side.
7. Direction of airflow.
8. Connector package CRBTMPWR001A01 is for thru-the-curb type gas.
   CRBTMPWR003A01 is for thru-the-base type gas connections.



C10423

Fig. 4 - Roof Curb Details

CURBS & WEIGHTS DIMENSIONS - 581J07-09



CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION 3/4"-14 NPT GAS CONNECTION
G	2 " [51] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART (FIELD INST)

THESE HOLES REQUIRED FOR USE WITH ACCY KITS:
CRBTMPWR001A01: 07 - GAS THRU CURB
CRBTMPWR002A01: 08,09 - GAS THRU CURB
CRBTMPWR003A01: 07 - GAS THRU BASEPAN
CRBTMPWR004A01: 08,09 - GAS THRU BASEPAN

	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	3/4" (001,003) 1 1/4" (002,004)	POWER	1 1/8" [28.6] 1 3/4" [44.4]
Z *	(003) 1/2" FPT (004) 3/4" FPT	GAS	1 1/8" [28.6] 1 3/4" [44.4]
*	(001 & 002) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING. HOLE SIZE: 2" [50.8]		

UNIT	J	K	H
581J-07A	41 1/4 [1048]	33 [658]	15 7/8 [403]
581J-08D	49 3/8 [1253]	36 3/8 (924)	15 7/8 [403]
581J-09D	49 3/8 [1253]	36 3/8 (924)	15 7/8 [403]

THRU-THE-BASE CHART (FIOP)

FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED. **

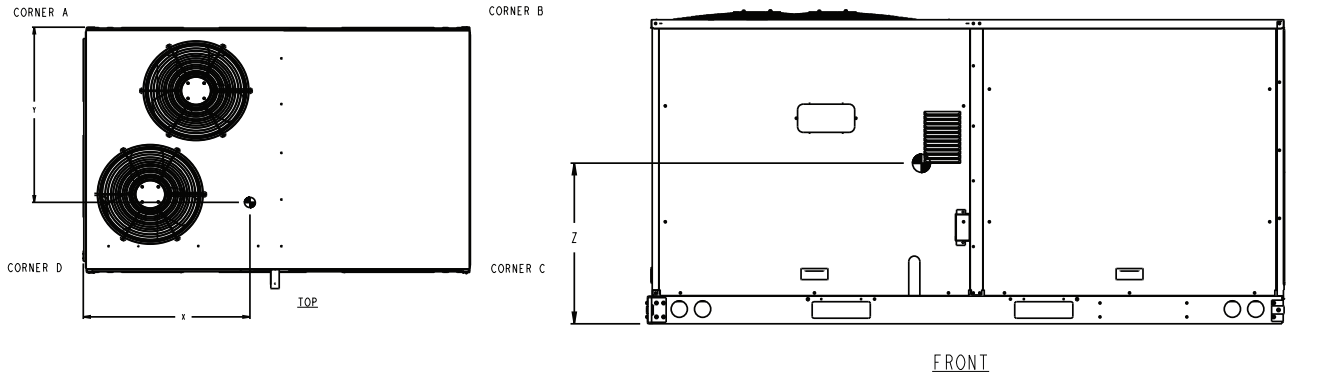
**	FOR BELOW LISTED MODELS, A FIELD SUPPLIED 1/2" ADAPTER IS REQUIRED BETWEEN BASE PAN FITTING AND GAS VALVE: 581J D,E,S,R-07 581J D,S-08 581J D,S-09

C10425

Fig. 5 - Dimensions 581J07-09

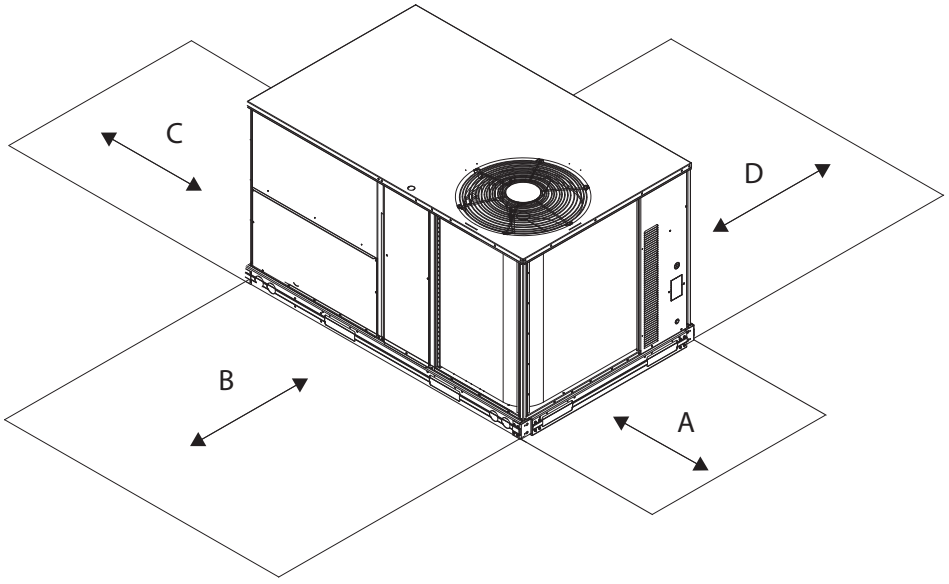
CURBS & WEIGHTS DIMENSIONS - 581J07-09 (cont.)

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
581J-07A	765	347	165.3	75	152.7	69.3	214.7	97.4	232.3	105.4	42 3/8 [1076]	34 3/4 [882.6]	19 7/8 [505]
581J-08D	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]
581J-09D	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]



C10381

Fig. 6 - Dimensions 581J07-09



C08337

Fig. 7 - Service Clearance

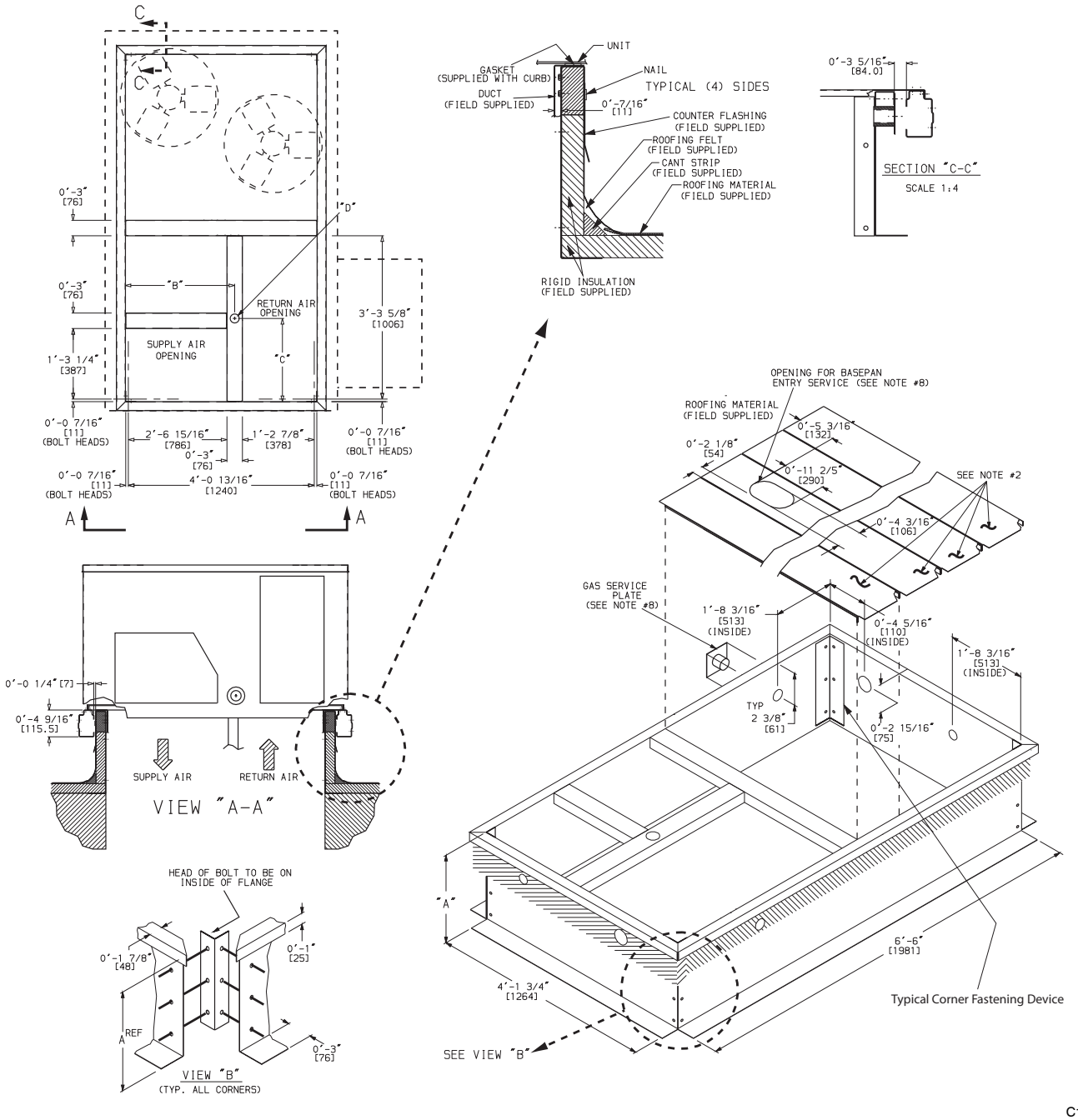
LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance
	12” (305 mm)	Minimum clearance
B	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36” (914 mm)	Surface behind servicer is electrically non−conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10−ft of unit fresh air intake hood
C	36” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non−conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10−ft of this unit’s flue outlet

CURBS & WEIGHTS DIMENSIONS - 581J07-09 (cont.)

ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB003A01	1' - 2" [356]	581J*A07 581J*D08-09
CRRFCURB004A01	2' - 0" [610]	

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 1" THK. POLYURETHANE FOAM, 1-3/4 # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: 16 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB)
6. SERVICE CLEARANCE 4' ON EACH SIDE.
7. ▨ DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB GAS TYPE. PACKAGES CRBTMPWR003A01 AND 4A01 ARE FOR THE THRU-THE-BOTTOM TYPE GAS CONNECTIONS.

CONNECTOR PKG. ACC.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01 CRBTMPWR002A01	2'-8 7/16" [827]	1'-10 15/16" [583]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT 1 1/4" [31.7]	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				1/2" [12.7] NPT	3/4" [19] NPT		
CRBTMPWR004A01				3/4" [19] NPT	1 1/4" [31.7]		



C10424

Fig. 8 - Roof Curb Details

OPTIONS & ACCESSORY WEIGHTS

OPTION / ACCESSORY	OPTION / ACCESSORY WEIGHTS											
	04		05		06		07		08		09	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
Power Exhaust – vertical	50	23	50	23	50	23	50	23	75	34	75	34
Power Exhaust – horizontal	30	14	30	14	30	14	30	14	30	14	30	14
EconoMi$er(IV or 2)	50	23	50	23	50	23	50	23	75	34	75	34
Two Position damper	39	18	39	18	39	18	39	18	58	26	58	26
Manual Dampers	12	5	12	5	12	5	18	8	18	8	18	8
Medium Gas Heat	12	5	9	4	9	4	9	4	15	7	15	7
High Gas Heat	–	–	17	8	17	8	17	8	29	13	29	13
Hail Guard (louvered)	16	7	16	7	16	7	16	7	34	15	34	15
Cu/Cu Condenser Coil	35	16	95	43	95	43	95	43	95	43	95	43
Cu/Cu Cond. & Evaporator Coils	60	27	130	59	150	68	165	75	185	88	195	88
Roof Curb (14–in. curb)	115	52	115	52	115	52	115	52	143	65	143	65
Roof Curb (24–in. curb)	197	89	197	89	197	89	197	89	245	111	245	111
CO_2 sensor	5	2	5	2	5	2	5	2	5	2	5	2
Flue Discharge Deflector	7	3	7	3	7	3	7	3	7	3	7	3
Optional Indoor Motor/Drive	10	5	10	5	10	5	10	5	15	7	15	7
Motor Master Controller	35	16	35	16	35	16	35	16	35	16	35	16
Return Smoke Detector	5	2	5	2	5	2	5	2	5	2	5	2
Supply Smoke Detector	5	2	5	2	5	2	5	2	5	2	5	2
Fan/Filter Status Switch	2	1	2	1	2	1	2	1	2	1	2	1
Non–Fused Disconnect	15	7	15	7	15	7	15	7	15	7	15	7
Powered Convenience outlet	35	16	35	16	35	16	35	16	35	16	35	16
Non–Powered Convenience outlet	5	2	5	2	5	2	5	2	5	2	5	2
Enthalpy Sensor	2	1	2	1	2	1	2	1	2	1	2	1
Differential Enthalpy Sensor	3	1	3	1	3	1	3	1	3	1	3	1

APPLICATION DATA

Min operating ambient temp (cooling):

In mechanical cooling mode, your Bryant rooftop unit can safely operate down to an outdoor ambient temperature of 35°F (-2°C) and 25°F (-4°C), with an accessory winter start kit. It is possible to provide cooling at lower outdoor ambient temperatures by using less outside air, economizers, and/or accessory low ambient kits.

Max operating ambient temp (cooling):

The maximum operating ambient temperature for cooling mode is 125°F (52°C). While cooling operation above 125°F (52°C) may be possible, it could cause either a reduction in performance, reliability, or a protective action by the unit's internal safety devices.

Min mixed air temp (heating):

Using the factory settings, the minimum temperatures for the mixed air (the combined temperature of the warm return air and the cold outdoor air) entering the dimpled, gas heat exchangers are:

Aluminized	Stainless Steel
50°F (10°C) continuous	40°F (4°C) continuous
45°F (7°C) intermittent	35°F (2°C) intermittent

Operating at lower mixed-air temperatures may be possible, if a field-supplied, outdoor air thermostat initiates both heat stages when the temperature is less than the minimum temperatures listed above. Please contact your local Bryant representative for assistance.

Min and max airflow (heating and cooling):

To maintain safe and reliable operation of your rooftop, operate within the heating airflow limits during heating mode and cooling airflow limits during cooling mode. Operating above the max may cause blow-off, undesired airflow noise, or airflow related problems with the rooftop unit. Operating below the min may cause problems with coil freeze-up and unsafe heating operation. Heating and cooling limitations differ when evaluating operating CFM, the minimum value is the HIGHER of the cooling and heating minimum CFM values published in Table 7 and the maximum value is the LOWER of the cooling and heating minimum values published in Table 7.

Heating-to-cooling changeover:

Your unit will automatically change from heating to cooling mode when using a thermostat with an auto-change-over feature.

Airflow:

All units are draw-though in cooling mode and blow-through in heating mode.

Outdoor air application strategies:

Economizers reduce operating expenses and compressor run time by providing a free source of cooling and a means of ventilation to match application changing needs. In fact, they should be considered for most applications. Also, consider the various economizer control methods and their benefits, as well as sensors required to accomplish your application goals. Please contact your local Bryant representative for assistance.

Motor limits, brake horsepower (BHP):

Due to internal design of Bryant units, the air path, and specially designed motors, the full horsepower (maximum continuous BHP) band, as listed in Table 8 and 10, can be used with the utmost confidence. There is no need for extra safety factors, as Bryant motors are designed and rigorously tested to use the entire, listed BHP range without either nuisance tripping or premature motor failure.

Propane heating:

Propane has different physical qualities than natural gas. As a result, Propane requires different fuel to air mixture. To optimize the fuel/air mixture for Propane, Bryant sells different burner orifices in an easy to install accessory kit. To select the correct burner orifices or determine the heat capacity for an Propane application, use either the selection software, or the unit's service manual.

High altitude heating:

High altitudes have less oxygen, which affects the fuel/air mixture in heat exchangers. In order to maintain a proper fuel/air mixture, heat exchangers operating in altitudes above 2000 ft (610 m) require different orifices. To select the correct burner orifices or determine the heat capacity for a high altitude application, use either the selection software, or the unit's service manual.

High altitudes have less oxygen, which means heat exchangers need less fuel. The new gas orifices in this field-installed kit make the necessary adjustment for high altitude applications. They restore the optimal fuel to air mixture and maintain healthy combustion on altitudes above 2000 ft (610 m).

NOTE: Typical natural gas heating value ranges from 975 to 1050 Btu/ft^3 at sea level nationally. The heating value goes down approximately 1.7% per every thousand feet elevation. Standard factory orifices can typically be used up to 2000 ft (610m) elevation without any operational issues.

NOTE: For installations in Canada, the input rating should be derated by 10% for altitudes from 2000 ft (610m)to 4500 ft (1372m) above sea level.

APPLICATION DATA (cont.)

Sizing a rooftop

Bigger isn't necessarily better. While an air conditioner needs to have enough capacity to meet the design loads, it doesn't need excess capacity. In fact, excess capacity typically results in very poor part load performance and humidity control.

Using higher design temperatures than ASHRAE recommends for your location, adding "safety factors" to the calculated load, are all signs of oversizing air conditioners. Oversizing the air conditioner leads to poor humidity control, reduced efficiency, higher utility bills, larger indoor temperature swings, excessive noise, and increased wear and tear on the air conditioner.

Rather than oversizing an air conditioner, engineers should "right-size" or even slightly undersize air conditioners. Correctly sizing an air conditioner controls humidity better; promotes efficiency; reduces utility bills; extends equipment life, and maintains even, comfortable temperatures. Please contact your local Bryant representative for assistance.

Low ambient applications

The optional Bryant economizer can adequately cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low-ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based "free cooling" is the preferred less costly and energy conscious method.

In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your Bryant rooftop can operate to ambient temperatures down to -20°F (-29°C) using the recommended accessory Motormaster low ambient controller.

SELECTION PROCEDURE (WITH 581J*07A EXAMPLE)[1]

I. Determine cooling and heating loads.

Given:

Mixed air dry bulb	80°F (27°C)
Mixed air wet bulb	67°F (19°C)
Ambient dry bulb	95°F (35°C)
TC_{Load}	73.6 MBH
SHC_{Load}	53.3 MBH
Vertical supply air	2100 CFM
Heating load	85.0 MBH
External static pressure	0.67 in. wg
Electrical characteristics	230-3-60

II. Make an initial guess at cooling tons.

Refrig. tons = TC_{Load} / 12 MBH per ton
Refrig. tons = 72.0 / 12 = 6.0 tons
In this case, start by looking at the 581J**07.

III. Look up the rooftop's TC and SHC.

Table 15 shows that, at the application's supply air CFM, mixed air and ambient temperatures, the 581J*A07 supplies:
TC = 73.6 MBH[2]
SHC = 53.3 MBH[2]

IV. Calculate the building latent heat load.

$LC_{Load} = TC_{Load} - SHC_{Load}$
LC_{Load} = 72.0 MBH - 54.0 MBH = 18.0 MBH

V. Calculate RTU latent heat capacity.

LC = TC - SHC
LC = 73.6 MBH - 53.3 MBH = 20.3 MBH

VI. Compare RTU capacities to loads.[3]

Compare the rooftop's SHC and LC to the building's sensible and latent heat loads.

VII. Select factory options (FIOP)

Local code requires an economizer for any unit with TC greater than 65.0 MBH.

VIII. Calculate the total static pressure.

External static pressure	0.67 in. wg
Sum of FIOP / Accessory static	+0.13 in. wg
Total Static Pressure	0.80 in. wg

IX. Look up the indoor fan RPM & BHP.

Table 36 shows, at 2100 CFM & ESP= 0.8,
RPM = 712 & BHP = 1.17

X. Convert BHP (Step VIII) into fan motor heat.

Fan motor heat = 2.546* BHP/Motor Eff.[4]
Fan motor heat = 3.7 MBH

XI. Calculate RTU heating capacity.

Building heating load	85.0 MBH
Fan motor heat	-3.7 MBH
Required heating capacity	81.3 MBH

XII. Select a gas heater.

Table 4 shows the heating capacities of the 581JEA07 = 103.0 MBH. Select the 581JEA07

XIII. Determine electrical requirements.

Table 45 shows the MCA and Breaker Size of a 581J*A07 (without convenience outlet) as:
MCA = 32.0 amps & MOCP = 50.0 amps
Min. disconnect size: FLA = 31.0 & LRA = 148.

LEGEND

BHP	— Break horsepower
FLA	— Full load amps
LC	— Latent capacity
LRA	— Lock rotor amp
MBH	— (1,000) BTUH
MCA	— Min. circuit ampacity
MOCP	— Max. over–current protection
RPM	— Revolutions per minute
RTU	— Rooftop unit
SHC	— Sensible heat capacity
TC	— Total capacity

NOTES:

1. Selection software by Bryant saves time by performing many of the steps above. Contact your Bryant sales representative for assistance.
2. Unit ratings are gross capacities and do not include the effect of evaporator fan motor heat. See Step XI. for determining amount of evaporator fan motor heat to subtract from total and sensible capacities to obtain net cooling and net sensible capacities.
3. Selecting a unit with a SHC slightly lower than the SHC_{Load} is often better than oversizing. Slightly lower SHC's will help control indoor humidity, and prevent temperature swings.
4. Indoor fan motor efficiency is available in Table 41. Use the decimal form in the equation, eg. 80% = .8.

TABLE 12 – COOLING CAPACITIES 1-STAGE COOLING 3 TONS

581J*04A				AMBIENT TEMPERATURE															
				85			95			105			115			125		
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
900 Cfm	EA (wb)	58	TC	32.1	32.1	36.3	30.8	30.8	34.9	29.4	29.4	33.4	28.0	28.0	31.7	26.3	26.3	29.8
			SHC	27.8	32.1	36.3	26.7	30.8	34.9	25.5	29.4	33.4	24.2	28.0	31.7	22.8	26.3	29.8
		62	TC	34.0	34.0	34.3	32.3	32.3	33.5	30.6	30.6	32.6	28.7	28.7	31.7	26.6	26.6	30.6
			SHC	25.0	29.7	34.3	24.2	28.9	33.5	23.4	28.0	32.6	22.5	27.1	31.7	21.5	26.0	30.6
		67	TC	37.3	37.3	37.3	35.5	35.5	35.5	33.6	33.6	33.6	31.5	31.5	31.5	29.2	29.2	29.2
			SHC	20.7	25.4	30.0	20.0	24.6	29.3	19.2	23.8	28.4	18.3	22.9	27.6	17.4	22.0	26.6
		72	TC	40.8	40.8	40.8	38.9	38.9	38.9	36.9	36.9	36.9	34.6	34.6	34.6	32.2	32.2	32.2
			SHC	16.3	21.0	25.7	15.6	20.3	25.0	14.8	19.5	24.1	13.9	18.6	23.3	13.0	17.7	22.3
		78	TC	–	43.9	43.9	–	41.8	41.8	–	39.6	39.6	–	37.2	37.2	–	34.6	34.6
			SHC	–	17.4	22.4	–	16.7	21.7	–	15.9	20.8	–	15.1	19.9	–	14.2	19.0
1050 Cfm	EA (wb)	58	TC	33.8	33.8	38.4	32.5	32.5	36.8	31.0	31.0	35.1	29.4	29.4	33.3	27.6	27.6	31.3
			SHC	29.3	33.8	38.4	28.1	32.5	36.8	26.9	31.0	35.1	25.5	29.4	33.3	23.9	27.6	31.3
		62	TC	35.1	35.1	37.5	33.3	33.3	36.6	31.5	31.5	35.7	29.6	29.6	34.5	27.7	27.7	32.6
			SHC	26.9	32.2	37.5	26.0	31.3	36.6	25.1	30.4	35.7	24.1	29.3	34.5	22.7	27.7	32.6
		67	TC	38.4	38.4	38.4	36.5	36.5	36.5	34.5	34.5	34.5	32.3	32.3	32.3	29.9	29.9	29.9
			SHC	22.0	27.3	32.7	21.2	26.5	31.9	20.3	25.7	31.0	19.4	24.8	30.1	18.5	23.8	29.1
		72	TC	42.0	42.0	42.0	40.0	40.0	40.0	37.8	37.8	37.8	35.5	35.5	35.5	32.9	32.9	32.9
			SHC	16.9	22.3	27.6	16.1	21.5	26.9	15.3	20.7	26.0	14.4	19.8	25.1	13.5	18.8	24.2
		78	TC	–	45.0	45.0	–	42.9	42.9	–	40.6	40.6	–	38.0	38.0	–	35.3	35.3
			SHC	–	18.1	23.8	–	17.4	23.0	–	16.6	22.2	–	15.7	21.3	–	14.8	20.3
1200 Cfm	EA (wb)	58	TC	35.3	35.3	40.0	33.9	33.9	38.4	32.3	32.3	36.6	30.6	30.6	34.7	28.7	28.7	32.5
			SHC	30.6	35.3	40.0	29.4	33.9	38.4	28.0	32.3	36.6	26.5	30.6	34.7	24.9	28.7	32.5
		62	TC	35.9	35.9	40.5	34.2	34.2	39.4	32.4	32.4	38.1	30.6	30.6	36.1	28.7	28.7	33.9
			SHC	28.6	34.5	40.5	27.7	33.6	39.4	26.6	32.4	38.1	25.2	30.6	36.1	23.6	28.7	33.9
		67	TC	39.3	39.3	39.3	37.3	37.3	37.3	35.2	35.2	35.2	32.9	32.9	32.9	30.5	30.5	31.6
			SHC	23.1	29.1	35.2	22.3	28.3	34.4	21.4	27.5	33.5	20.5	26.6	32.6	19.5	25.6	31.6
		72	TC	42.9	42.9	42.9	40.8	40.8	40.8	38.5	38.5	38.5	36.1	36.1	36.1	33.4	33.4	33.4
			SHC	17.3	23.4	29.5	16.6	22.6	28.7	15.7	21.8	27.9	14.8	20.9	27.0	13.9	19.9	26.0
		78	TC	–	45.9	45.9	–	43.7	43.7	–	41.3	41.3	–	38.7	38.7	–	35.9	35.9
			SHC	–	18.8	25.1	–	18.0	24.3	–	17.2	23.4	–	16.3	22.5	–	15.4	21.5
1350 Cfm	EA (wb)	58	TC	36.6	36.6	41.5	35.1	35.1	39.7	33.4	33.4	37.9	31.6	31.6	35.8	29.6	29.6	33.6
			SHC	31.7	36.6	41.5	30.4	35.1	39.7	28.9	33.4	37.9	27.4	31.6	35.8	25.7	29.6	33.6
		62	TC	36.7	36.7	43.2	35.1	35.1	41.3	33.4	33.4	39.4	31.6	31.6	37.3	29.6	29.6	34.9
			SHC	30.2	36.7	43.2	28.8	35.1	41.3	27.5	33.4	39.4	26.0	31.6	37.3	24.4	29.6	34.9
		67	TC	39.9	39.9	39.9	37.9	37.9	37.9	35.8	35.8	35.9	33.4	33.4	34.9	30.9	30.9	33.9
			SHC	24.2	30.9	37.6	23.4	30.1	36.8	22.5	29.2	35.9	21.6	28.3	34.9	20.6	27.2	33.9
		72	TC	43.6	43.6	43.6	41.4	41.4	41.4	39.1	39.1	39.1	36.6	36.6	36.6	33.9	33.9	33.9
			SHC	17.8	24.5	31.3	17.0	23.7	30.5	16.1	22.9	29.6	15.2	22.0	28.7	14.3	21.0	27.7
		78	TC	–	46.7	46.7	–	44.4	44.4	–	41.9	41.9	–	39.2	39.2	–	36.3	36.3
			SHC	–	19.4	26.3	–	18.6	25.5	–	17.8	24.6	–	16.9	23.7	–	15.9	22.7
1500 Cfm	EA (wb)	58	TC	37.7	37.7	42.7	36.1	36.1	40.9	34.3	34.3	38.9	32.5	32.5	36.8	30.4	30.4	34.4
			SHC	32.6	37.7	42.7	31.3	36.1	40.9	29.8	34.3	38.9	28.1	32.5	36.8	26.3	30.4	34.4
		62	TC	37.7	37.7	44.4	36.1	36.1	42.5	34.4	34.4	40.5	32.5	32.5	38.3	30.4	30.4	35.8
			SHC	31.0	37.7	44.4	29.7	36.1	42.5	28.3	34.4	40.5	26.7	32.5	38.3	25.0	30.4	35.8
		67	TC	40.5	40.5	40.5	38.4	38.4	39.1	36.2	36.2	38.2	33.8	33.8	37.2	31.2	31.2	36.1
			SHC	25.2	32.6	40.0	24.4	31.7	39.1	23.5	30.8	38.2	22.5	29.9	37.2	21.5	28.8	36.1
		72	TC	44.2	44.2	44.2	41.9	41.9	41.9	39.6	39.6	39.6	37.0	37.0	37.0	34.2	34.2	34.2
			SHC	18.2	25.6	33.0	17.4	24.8	32.2	16.5	23.9	31.3	15.6	23.0	30.4	14.7	22.0	29.4
		78	TC	–	47.2	47.2	–	44.9	44.9	–	42.3	42.3	–	39.6	39.6	–	36.7	36.7
			SHC	–	19.9	27.5	–	19.1	26.7	–	18.3	25.8	–	17.4	24.9	–	16.4	23.9

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 13 – COOLING CAPACITIES 1-STAGE COOLING 4 TONS

581J*05A				AMBIENT TEMPERATURE															
				85			95			105			115			125			
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
1200 Cfm	EA (wb)	58	TC	43.2	43.2	49.1	41.5	41.5	47.2	39.7	39.7	45.1	37.7	37.7	42.9	35.6	35.6	40.4	
			SHC	37.3	43.2	49.1	35.9	41.5	47.2	34.3	39.7	45.1	32.6	37.7	42.9	30.7	35.6	40.4	
		62	TC	45.9	45.9	46.0	43.7	43.7	45.0	41.3	41.3	43.8	38.8	38.8	42.6	36.0	36.0	41.2	
			SHC	33.5	39.8	46.0	32.5	38.7	45.0	31.3	37.6	43.8	30.1	36.3	42.6	28.8	35.0	41.2	
		67	TC	50.5	50.5	50.5	48.0	48.0	48.0	45.4	45.4	45.4	42.6	42.6	42.6	39.6	39.6	39.6	
			SHC	27.9	34.1	40.4	26.8	33.1	39.4	25.7	32.0	38.2	24.5	30.8	37.1	23.2	29.5	35.8	
		72	TC	55.4	55.4	55.4	52.7	52.7	52.7	49.9	49.9	49.9	46.8	46.8	46.8	43.5	43.5	43.5	
			SHC	22.0	28.4	34.7	21.0	27.3	33.7	19.9	26.2	32.5	18.7	25.0	31.3	17.4	23.8	30.1	
		78	TC	–	59.7	59.7	–	56.8	56.8	–	53.7	53.7	–	50.4	50.4	–	46.8	46.8	
			SHC	–	23.6	30.2	–	22.6	29.2	–	21.5	28.1	–	20.3	26.8	–	19.1	25.5	
1400 Cfm	EA (wb)	58	TC	45.6	45.6	51.9	43.8	43.8	49.8	41.9	41.9	47.6	39.7	39.7	45.1	37.3	37.3	42.4	
			SHC	39.4	45.6	51.9	37.9	43.8	49.8	36.2	41.9	47.6	34.3	39.7	45.1	32.3	37.3	42.4	
		62	TC	47.4	47.4	50.5	45.1	45.1	49.3	42.6	42.6	48.0	40.0	40.0	46.5	37.4	37.4	44.2	
			SHC	36.0	43.2	50.5	34.9	42.1	49.3	33.7	40.9	48.0	32.4	39.5	46.5	30.6	37.4	44.2	
		67	TC	52.1	52.1	52.1	49.5	49.5	49.5	46.7	46.7	46.7	43.7	43.7	43.7	40.5	40.5	40.5	
			SHC	29.5	36.8	44.0	28.4	35.7	42.9	27.3	34.5	41.8	26.0	33.3	40.5	24.7	32.0	39.2	
		72	TC	57.1	57.1	57.1	54.3	54.3	54.3	51.2	51.2	51.2	48.0	48.0	48.0	44.5	44.5	44.5	
			SHC	22.8	30.1	37.4	21.7	29.0	36.3	20.5	27.8	35.1	19.3	26.6	33.9	18.0	25.3	32.6	
		78	TC	–	61.4	61.4	–	58.3	58.3	–	55.1	55.1	–	51.6	51.6	–	47.8	47.8	
			SHC	–	24.6	32.2	–	23.5	31.1	–	22.4	29.9	–	21.2	28.7	–	19.9	27.4	
1600 Cfm	EA (wb)	58	TC	47.7	47.7	54.2	45.8	45.8	52.0	43.7	43.7	49.6	41.3	41.3	47.0	38.8	38.8	44.1	
			SHC	41.2	47.7	54.2	39.5	45.8	52.0	37.7	43.7	49.6	35.7	41.3	47.0	33.5	38.8	44.1	
		62	TC	48.7	48.7	54.5	46.3	46.3	53.2	43.7	43.7	51.7	41.4	41.4	48.9	38.8	38.8	45.9	
			SHC	38.3	46.4	54.5	37.1	45.2	53.2	35.8	43.7	51.7	33.9	41.4	48.9	31.8	38.8	45.9	
		67	TC	53.3	53.3	53.3	50.6	50.6	50.6	47.7	47.7	47.7	44.6	44.6	44.6	41.2	41.2	42.6	
			SHC	31.0	39.2	47.5	29.9	38.1	46.3	28.7	37.0	45.2	27.5	35.7	43.9	26.2	34.4	42.6	
		72	TC	58.4	58.4	58.4	55.4	55.4	55.4	52.3	52.3	52.3	48.9	48.9	48.9	45.2	45.2	45.2	
			SHC	23.4	31.7	39.9	22.3	30.6	38.8	21.1	29.4	37.6	19.9	28.2	36.4	18.6	26.8	35.1	
		78	TC	–	62.7	62.7	–	59.5	59.5	–	56.1	56.1	–	52.5	52.5	–	48.6	48.6	
			SHC	–	25.5	34.0	–	24.4	32.9	–	23.2	31.7	–	22.0	30.4	–	20.7	29.1	
1800 Cfm	EA (wb)	58	TC	49.5	49.5	56.2	47.4	47.4	53.9	45.2	45.2	51.3	42.7	42.7	48.5	40.1	40.1	45.5	
			SHC	42.8	49.5	56.2	41.0	47.4	53.9	39.0	45.2	51.3	36.9	42.7	48.5	34.6	40.1	45.5	
		62	TC	49.8	49.8	58.1	47.5	47.5	56.1	45.2	45.2	53.4	42.8	42.8	50.5	40.1	40.1	47.4	
			SHC	40.4	49.2	58.1	38.8	47.5	56.1	37.0	45.2	53.4	35.0	42.8	50.5	32.8	40.1	47.4	
		67	TC	54.3	54.3	54.3	51.5	51.5	51.5	48.5	48.5	48.5	45.3	45.3	47.1	41.8	41.8	45.7	
			SHC	32.5	41.7	50.8	31.4	40.5	49.7	30.2	39.3	48.5	28.9	38.0	47.1	27.5	36.6	45.7	
		72	TC	59.4	59.4	59.4	56.3	56.3	56.3	53.1	53.1	53.1	49.6	49.6	49.6	45.8	45.8	45.8	
			SHC	24.0	33.2	42.4	22.9	32.1	41.3	21.7	30.9	40.1	20.4	29.6	38.8	19.1	28.3	37.5	
		78	TC	–	63.8	63.8	–	60.5	60.5	–	57.0	57.0	–	53.2	53.2	–	49.2	49.2	
			SHC	–	26.3	35.8	–	25.2	34.6	–	24.0	33.4	–	22.8	32.1	–	21.5	30.8	
2000 Cfm	EA (wb)	58	TC	51.0	51.0	58.0	48.8	48.8	55.5	46.5	46.5	52.8	43.9	43.9	49.9	41.1	41.1	46.7	
			SHC	44.1	51.0	58.0	42.2	48.8	55.5	40.2	46.5	52.8	37.9	43.9	49.9	35.5	41.1	46.7	
		62	TC	51.1	51.1	60.4	48.9	48.9	57.8	46.5	46.5	55.0	44.0	44.0	51.9	41.1	41.1	48.6	
			SHC	41.8	51.1	60.4	40.0	48.9	57.8	38.1	46.5	55.0	36.0	44.0	51.9	33.7	41.1	48.6	
		67	TC	55.1	55.1	55.1	52.1	52.1	52.9	49.1	49.1	51.6	45.8	45.8	50.2	42.3	42.3	48.7	
			SHC	33.9	44.0	54.1	32.7	42.8	52.9	31.5	41.5	51.6	30.2	40.2	50.2	28.8	38.8	48.7	
		72	TC	60.3	60.3	60.3	57.1	57.1	57.1	53.7	53.7	53.7	50.1	50.1	50.1	46.3	46.3	46.3	
			SHC	24.5	34.7	44.8	23.4	33.5	43.6	22.2	32.3	42.4	21.0	31.1	41.2	19.6	29.7	39.8	
		78	TC	–	64.6	64.6	–	61.2	61.2	–	57.6	57.6	–	53.8	53.8	–	49.7	49.7	
			SHC	–	27.1	37.5	–	26.0	36.3	–	24.8	35.1	–	23.5	33.8	–	22.2	32.4	

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 14 – COOLING CAPACITIES 1-STAGE COOLING 5 TONS

581J*06A				AMBIENT TEMPERATURE																
				85			95			105			115			125				
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)				
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
1500 Cfm	EA (wb)	58	TC	53.4	53.4	60.6	51.3	51.3	58.2	49.0	49.0	55.6	46.5	46.5	52.7	43.7	43.7	49.5		
			SHC	46.3	53.4	60.6	44.5	51.3	58.2	42.5	49.0	55.6	40.3	46.5	52.7	37.9	43.7	49.5		
		62	TC	55.6	55.6	58.2	52.9	52.9	56.9	50.0	50.0	55.5	46.9	46.9	53.9	43.8	43.8	51.6		
			SHC	42.0	50.1	58.2	40.7	48.8	56.9	39.4	47.4	55.5	37.9	45.9	53.9	36.0	43.8	51.6		
		67	TC	60.8	60.8	60.8	57.8	57.8	57.8	54.6	54.6	54.6	51.1	51.1	51.1	47.4	47.4	47.4		
			SHC	34.4	42.6	50.7	33.2	41.3	49.4	31.8	39.9	48.1	30.4	38.5	46.6	28.9	37.0	45.1		
		72	TC	66.6	66.6	66.6	63.2	63.2	63.2	59.7	59.7	59.7	55.9	55.9	55.9	51.8	51.8	51.8		
			SHC	26.7	34.8	43.0	25.4	33.6	41.7	24.1	32.2	40.4	22.6	30.8	38.9	21.1	29.3	37.4		
		78	TC	–	71.4	71.4	–	67.9	67.9	–	64.0	64.0	–	59.9	59.9	–	55.5	55.5		
			SHC	–	28.5	36.7	–	27.2	35.5	–	25.9	34.2	–	24.5	32.7	–	23.0	31.3		
1750 Cfm	EA (wb)	58	TC	56.3	56.3	63.8	54.0	54.0	61.2	51.5	51.5	58.3	48.7	48.7	55.2	45.7	45.7	51.8		
			SHC	48.8	56.3	63.8	46.8	54.0	61.2	44.6	51.5	58.3	42.2	48.7	55.2	39.6	45.7	51.8		
		62	TC	57.3	57.3	64.0	54.5	54.5	62.5	51.6	51.6	60.7	48.8	48.8	57.5	45.8	45.8	53.9		
			SHC	45.3	54.7	64.0	44.0	53.3	62.5	42.4	51.6	60.7	40.1	48.8	57.5	37.6	45.8	53.9		
		67	TC	62.5	62.5	62.5	59.3	59.3	59.3	55.9	55.9	55.9	52.3	52.3	52.3	48.3	48.3	49.7		
			SHC	36.6	46.0	55.4	35.3	44.7	54.1	33.9	43.3	52.7	32.4	41.8	51.3	30.9	40.3	49.7		
		72	TC	68.3	68.3	68.3	64.8	64.8	64.8	61.0	61.0	61.0	57.0	57.0	57.0	52.7	52.7	52.7		
			SHC	27.5	37.0	46.5	26.2	35.7	45.2	24.9	34.4	43.8	23.4	32.9	42.4	21.9	31.4	40.8		
		78	TC	–	73.2	73.2	–	69.4	69.4	–	65.4	65.4	–	61.1	61.1	–	56.5	56.5		
			SHC	–	29.7	39.3	–	28.4	38.0	–	27.1	36.7	–	25.6	35.2	–	24.1	33.7		
2000 Cfm	EA (wb)	58	TC	58.7	58.7	66.5	56.2	56.2	63.7	53.5	53.5	60.6	50.6	50.6	57.3	47.3	47.3	53.7		
			SHC	50.9	58.7	66.5	48.7	56.2	63.7	46.4	53.5	60.6	43.8	50.6	57.3	41.0	47.3	53.7		
		62	TC	58.8	58.8	69.2	56.3	56.3	66.3	53.6	53.6	63.1	50.6	50.6	59.6	47.4	47.4	55.8		
			SHC	48.3	58.8	69.2	46.3	56.3	66.3	44.0	53.6	63.1	41.6	50.6	59.6	39.0	47.4	55.8		
		67	TC	63.8	63.8	63.8	60.4	60.4	60.4	56.9	56.9	57.3	53.1	53.1	55.8	49.1	49.1	54.1		
			SHC	38.6	49.3	60.1	37.3	48.0	58.7	35.9	46.6	57.3	34.4	45.1	55.8	32.8	43.4	54.1		
		72	TC	69.6	69.6	69.6	65.9	65.9	65.9	62.1	62.1	62.1	57.9	57.9	57.9	53.5	53.5	53.5		
			SHC	28.4	39.1	49.9	27.0	37.8	48.6	25.7	36.4	47.2	24.2	35.0	45.7	22.6	33.4	44.2		
		78	TC	–	74.5	74.5	–	70.6	70.6	–	66.5	66.5	–	62.0	62.0	–	–	–		
			SHC	–	30.8	41.8	–	29.5	40.4	–	28.2	39.0	–	26.7	37.6	–	–	–		
2250 Cfm	EA (wb)	58	TC	60.7	60.7	68.8	58.1	58.1	65.8	55.2	55.2	62.6	52.1	52.1	59.1	48.7	48.7	55.2		
			SHC	52.6	60.7	68.8	50.3	58.1	65.8	47.9	55.2	62.6	45.2	52.1	59.1	42.2	48.7	55.2		
		62	TC	60.8	60.8	71.6	58.1	58.1	68.5	55.3	55.3	65.1	52.2	52.2	61.4	48.7	48.7	57.4		
			SHC	50.0	60.8	71.6	47.8	58.1	68.5	45.4	55.3	65.1	42.9	52.2	61.4	40.1	48.7	57.4		
		67	TC	64.7	64.7	64.7	61.3	61.3	63.2	57.7	57.7	61.7	53.8	53.8	60.1	49.7	49.7	58.3		
			SHC	40.6	52.6	64.5	39.2	51.2	63.2	37.8	49.7	61.7	36.2	48.2	60.1	34.6	46.5	58.3		
		72	TC	70.6	70.6	70.6	66.8	66.8	66.8	62.8	62.8	62.8	58.6	58.6	58.6	54.0	54.0	54.0		
			SHC	29.1	41.2	53.3	27.8	39.9	51.9	26.4	38.4	50.5	24.9	37.0	49.0	23.3	35.4	47.4		
		78	TC	–	75.6	75.6	–	71.6	71.6	–	67.3	67.3	–	–	–	–	–	–		
			SHC	–	31.9	44.1	–	30.6	42.8	–	29.2	41.4	–	–	–	–	–	–		
2500 Cfm	EA (wb)	58	TC	62.5	62.5	70.8	59.7	59.7	67.6	56.7	56.7	64.2	53.4	53.4	60.5	49.9	49.9	56.5		
			SHC	54.1	62.5	70.8	51.7	59.7	67.6	49.1	56.7	64.2	46.3	53.4	60.5	43.2	49.9	56.5		
		62	TC	62.5	62.5	73.6	59.7	59.7	70.3	56.7	56.7	66.8	53.5	53.5	63.0	49.9	49.9	58.8		
			SHC	51.4	62.5	73.6	49.1	59.7	70.3	46.6	56.7	66.8	43.9	53.5	63.0	41.0	49.9	58.8		
		67	TC	65.5	65.5	68.9	62.0	62.0	67.4	58.3	58.3	65.9	54.4	54.4	64.2	50.2	50.2	62.2		
			SHC	42.5	55.7	68.9	41.1	54.3	67.4	39.6	52.7	65.9	38.0	51.1	64.2	36.3	49.2	62.2		
		72	TC	71.4	71.4	71.4	67.5	67.5	67.5	63.4	63.4	63.4	59.1	59.1	59.1	54.4	54.4	54.4		
			SHC	29.9	43.2	56.5	28.5	41.8	55.2	27.1	40.4	53.7	25.6	38.9	52.2	24.0	37.3	50.6		
		78	TC	–	76.4	76.4	–	72.3	72.3	–	–	–	–	–	–	–	–	–		
			SHC	–	33.0	46.4	–	31.6	45.1	–	–	–	–	–	–	–	–	–		

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 15 – COOLING CAPACITIES 1-STAGE COOLING 6 TONS

581J*07A				AMBIENT TEMPERATURE															
				85			95			105			115			125			
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
1800 Cfm	EA (wb)	58	THC	64.1	64.1	72.5	61.8	61.8	69.9	59.2	59.2	67	56.3	56.3	63.7	53.2	53.2	60.2	
			SHC	55.7	64.1	72.5	53.7	61.8	69.9	51.4	59.2	67	48.9	56.3	63.7	46.2	53.2	60.2	
		62	THC	67.9	67.9	68.5	64.9	64.9	67	61.5	61.5	65.3	57.9	57.9	63.5	54	54	61.4	
			SHC	50.2	59.4	68.5	48.8	57.9	67	47.1	56.2	65.3	45.4	54.4	63.5	43.4	52.4	61.4	
		67	THC	74.8	74.8	74.8	71.5	71.5	71.5	67.8	67.8	67.8	63.8	63.8	63.8	59.5	59.5	59.5	
			SHC	41.8	50.9	60.1	40.3	49.5	58.7	38.8	47.9	57.1	37.1	46.2	55.4	35.3	44.4	53.6	
		72	THC	82.2	82.2	82.2	78.7	78.7	78.7	74.7	74.7	74.7	70.4	70.4	70.4	65.6	65.6	65.6	
			SHC	33	42.3	51.6	31.6	40.9	50.2	30.1	39.3	48.6	28.4	37.7	46.9	26.7	35.9	45.1	
		78	THC	–	88.7	88.7	–	84.8	84.8	–	80.6	80.6	–	76	76	–	70.9	70.9	
			SHC	–	35.3	45.2	–	33.9	43.7	–	32.4	42	–	30.7	40.3	–	28.9	38.5	
2100 Cfm	EA (wb)	58	THC	67.6	67.6	76.5	65.1	65.1	73.7	62.3	62.3	70.5	59.3	59.3	67.1	55.9	55.9	63.2	
			SHC	58.7	67.6	76.5	56.6	65.1	73.7	54.1	62.3	70.5	51.5	59.3	67.1	48.5	55.9	63.2	
		62	THC	70.1	70.1	74.9	67	67	73.2	63.5	63.5	71.3	59.7	59.7	69.1	56	56	65.8	
			SHC	53.9	64.4	74.9	52.4	62.8	73.2	50.6	61	71.3	48.7	58.9	69.1	46.2	56	65.8	
		67	THC	77.1	77.1	77.1	73.6	73.6	73.6	69.7	69.7	69.7	65.5	65.5	65.5	60.9	60.9	60.9	
			SHC	44.2	54.8	65.3	42.7	53.3	63.9	41.2	51.7	62.3	39.4	50	60.5	37.6	48.1	58.6	
		72	THC	84.7	84.7	84.7	80.9	80.9	80.9	76.8	76.8	76.8	72.2	72.2	72.2	67.2	67.2	67.2	
			SHC	34.2	44.8	55.5	32.7	43.4	54	31.1	41.8	52.4	29.5	40.1	50.7	27.6	38.2	48.8	
		76	THC	–	91.3	91.3	–	87.2	87.2	–	82.7	82.7	–	77.8	77.8	–	72.5	72.5	
			SHC	–	36.7	47.8	–	35.3	46.3	–	33.7	44.7	–	32	43	–	30.2	41.1	
2400 Cfm	EA (wb)	58	THC	70.6	70.6	79.9	68	68	76.9	65	65	73.5	61.7	61.7	69.8	58.1	58.1	65.8	
			SHC	61.3	70.6	79.9	59	68	76.9	56.4	65	73.5	53.6	61.7	69.8	50.5	58.1	65.8	
		62	THC	72	72	80.6	68.7	68.7	78.7	65.2	65.2	76.6	61.8	61.8	72.6	58.2	58.2	68.4	
			SHC	57.3	69	80.6	55.6	67.2	78.7	53.7	65.2	76.6	50.9	61.8	72.6	48	58.2	68.4	
		67	THC	78.9	78.9	78.9	75.2	75.2	75.2	71.2	71.2	71.2	66.8	66.8	66.8	62	62	63.4	
			SHC	46.5	58.4	70.3	45	56.9	68.8	43.4	55.3	67.2	41.6	53.5	65.4	39.7	51.6	63.4	
		72	THC	86.6	86.6	86.6	82.7	82.7	82.7	78.3	78.3	78.3	73.6	73.6	73.6	68.4	68.4	68.4	
			SHC	35.2	47.2	59.2	33.7	45.7	57.7	32.1	44.1	56	30.4	42.3	54.3	28.5	40.5	52.4	
		78	THC	–	93.3	93.3	–	89	89	–	84.4	84.4	–	79.3	79.3	–	73.7	73.7	
			SHC	–	38	50.4	–	36.6	48.9	–	35	47.3	–	33.3	45.5	–	31.4	43.6	
2700 Cfm	EA (wb)	58	THC	73.2	73.2	82.8	70.4	70.4	79.6	67.3	67.3	76.1	63.8	63.8	72.2	60	60	67.9	
			SHC	63.6	73.2	82.8	61.1	70.4	79.6	58.4	67.3	76.1	55.4	63.8	72.2	52.1	60	67.9	
		62	THC	73.7	73.7	85.5	70.5	70.5	82.8	67.3	67.3	79.1	63.9	63.9	75.1	60.1	60.1	70.6	
			SHC	60.2	72.9	85.5	58.1	70.5	82.8	55.5	67.3	79.1	52.7	63.9	75.1	49.5	60.1	70.6	
		67	THC	80.3	80.3	80.3	76.5	76.5	76.5	72.4	72.4	72.4	67.8	67.8	70	62.9	62.9	67.9	
			SHC	48.7	61.9	75.1	47.1	60.4	73.6	45.5	58.7	71.9	43.7	56.8	70	41.7	54.8	67.9	
		72	THC	88.2	88.2	88.2	84	84	84	79.6	79.6	79.6	74.6	74.6	74.6	69.3	69.3	69.3	
			SHC	36.1	49.4	62.7	34.6	47.9	61.2	33	46.2	59.5	31.2	44.5	57.7	29.3	42.6	55.8	
		78	THC	–	94.9	94.9	–	90.4	90.4	–	85.6	85.6	–	80.4	80.4	–	74.7	74.7	
			SHC	–	39.2	52.9	–	37.7	51.4	–	36.1	49.7	–	34.4	47.9	–	32.5	46	
3000 Cfm	EA (wb)	58	THC	75.4	75.4	85.3	72.5	72.5	82	69.2	69.2	78.3	65.6	65.6	74.2	61.7	61.7	69.8	
			SHC	65.5	75.4	85.3	62.9	72.5	82	60.1	69.2	78.3	57	65.6	74.2	53.5	61.7	69.8	
		62	THC	75.5	75.5	88.7	72.5	72.5	85.3	69.3	69.3	81.4	65.7	65.7	77.2	61.7	61.7	72.5	
			SHC	62.2	75.5	88.7	59.8	72.5	85.3	57.1	69.3	81.4	54.1	65.7	77.2	50.9	61.7	72.5	
		67	THC	81.4	81.4	81.4	77.5	77.5	78.1	73.3	73.3	76.4	68.7	68.7	74.4	63.7	63.7	72.2	
			SHC	50.7	65.2	79.7	49.2	63.7	78.1	47.5	61.9	76.4	45.6	60	74.4	43.6	57.9	72.2	
		72	THC	89.4	89.4	89.4	85.2	85.2	85.2	80.5	80.5	80.5	75.5	75.5	75.5	70.1	70.1	70.1	
			SHC	36.9	51.5	66.1	35.4	50	64.6	33.8	48.3	62.9	32	46.5	61.1	30.1	44.6	59.1	
		78	THC	–	96.1	96.1	–	91.6	91.6	–	86.7	86.7	–	81.3	81.3	–	75.5	75.5	
			SHC	–	40.4	55.3	–	38.9	53.8	–	37.2	52.1	–	35.5	50.3	–	33.6	48.3	

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 16 – COOLING CAPACITIES 2-STAGE COOLING 7.5 TONS

581J*08D				AMBIENT TEMPERATURE															
				85			95			105			115			125			
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
2250 Cfm	EA (wb)	58	THC	81	81	91.8	77.9	77.9	88.4	74.7	74.7	84.6	71.1	71.1	80.6	67.3	67.3	76.3	
			SHC	70.2	81	91.8	67.5	77.9	88.4	64.7	74.7	84.6	61.6	71.1	80.6	58.3	67.3	76.3	
		62	THC	85.1	85.1	87.2	81.1	81.1	85.3	76.9	76.9	83.2	72.5	72.5	81	67.8	67.8	78.5	
			SHC	63.3	75.3	87.2	61.4	73.4	85.3	59.5	71.3	83.2	57.3	69.2	81	55	66.7	78.5	
		67	THC	93.3	93.3	93.3	89	89	89	84.3	84.3	84.3	79.4	79.4	79.4	74.1	74.1	74.1	
			SHC	52.3	64.2	76.2	50.4	62.4	74.4	48.4	60.4	72.4	46.4	58.3	70.3	44.2	56.2	68.1	
		72	THC	102.3	102.3	102.3	97.5	97.5	97.5	92.5	92.5	92.5	87.1	87.1	87.1	81.3	81.3	81.3	
			SHC	40.9	53	65	39	51.1	63.1	37.1	49.2	61.2	35.1	47.1	59.1	32.9	44.9	57	
		76	THC	–	110	110	–	104.8	104.8	–	99.4	99.4	–	93.5	93.5	–	87.3	87.3	
			SHC	–	43.7	56.1	–	41.9	54.2	–	39.9	52.2	–	37.9	50.2	–	35.8	48	
2625 Cfm	EA (wb)	58	THC	85.4	85.4	96.9	82.1	82.1	93.1	78.6	78.6	89.1	74.7	74.7	84.7	70.5	70.5	80	
			SHC	74	85.4	96.9	71.2	82.1	93.1	68.1	78.6	89.1	64.7	74.7	84.7	61.1	70.5	80	
		62	THC	87.8	87.8	95.7	83.7	83.7	93.6	79.3	79.3	91.3	75	75	87.8	70.6	70.6	83.2	
			SHC	68.2	82	95.7	66.2	79.9	93.6	64.1	77.7	91.3	61.3	74.6	87.8	58	70.6	83.2	
		67	THC	96	96	96	91.4	91.4	91.4	86.5	86.5	86.5	81.3	81.3	81.3	75.8	75.8	75.8	
			SHC	55.4	69.3	83.2	53.5	67.4	81.2	51.5	65.4	79.2	49.4	63.2	77.1	47.2	61	74.8	
		72	THC	105.2	105.2	105.2	100.1	100.1	100.1	94.8	94.8	94.8	89.1	89.1	89.1	83	83	83	
			SHC	42.3	56.2	70.2	40.4	54.3	68.2	38.4	52.3	66.2	36.3	50.2	64.1	34.1	48	61.9	
		76	THC	–	112.9	112.9	–	107.5	107.5	–	101.7	101.7	–	95.6	95.6	–	89.1	89.1	
			SHC	–	45.5	59.8	–	43.6	57.8	–	41.7	55.8	–	39.6	53.7	–	37.4	51.5	
3000 Cfm	EA (wb)	58	THC	89.2	89.2	101.1	85.6	85.6	97.1	81.8	81.8	92.8	77.7	77.7	88.1	73.2	73.2	83	
			SHC	77.3	89.2	101.1	74.2	85.6	97.1	70.9	81.8	92.8	67.3	77.7	88.1	63.5	73.2	83	
		62	THC	90.1	90.1	103.5	86.1	86.1	100.3	81.9	81.9	96.5	77.8	77.8	91.6	73.3	73.3	86.4	
			SHC	72.7	88.1	103.5	70.1	85.2	100.3	67.3	81.9	96.5	63.9	77.8	91.6	60.2	73.3	86.4	
		67	THC	98.1	98.1	98.1	93.3	93.3	93.3	88.2	88.2	88.2	82.8	82.8	83.6	77	77	81.3	
			SHC	58.4	74.1	89.9	56.5	72.2	87.9	54.4	70.1	85.8	52.3	67.9	83.6	50	65.6	81.3	
		72	THC	107.3	107.3	107.3	102.1	102.1	102.1	96.5	96.5	96.5	90.6	90.6	90.6	84.3	84.3	84.3	
			SHC	43.5	59.3	75.1	41.6	57.3	73.1	39.5	55.3	71.1	37.4	53.2	69	35.2	50.9	66.7	
		76	THC	–	115.2	115.2	–	109.5	109.5	–	103.5	103.5	–	97.2	97.2	–	90.4	90.4	
			SHC	–	47.2	63.2	–	45.3	61.3	–	43.3	59.3	–	41.2	57.1	–	38.9	54.8	
3375 Cfm	EA (wb)	58	THC	92.4	92.4	104.7	88.6	88.6	100.4	84.6	84.6	95.9	80.2	80.2	90.9	75.5	75.5	85.6	
			SHC	80	92.4	104.7	76.8	88.6	100.4	73.3	84.6	95.9	69.5	80.2	90.9	65.4	75.5	85.6	
		62	THC	92.5	92.5	109	88.7	88.7	104.5	84.6	84.6	99.7	80.3	80.3	94.6	75.6	75.6	89	
			SHC	76	92.5	109	72.9	88.7	104.5	69.6	84.6	99.7	66	80.3	94.6	62.1	75.6	89	
		67	THC	99.7	99.7	99.7	94.8	94.8	94.8	89.5	89.5	92.2	84	84	89.9	78	78	87.4	
			SHC	61.3	78.8	96.4	59.3	76.8	94.3	57.2	74.7	92.2	55	72.4	89.9	52.6	70	87.4	
		72	THC	109	109	109	103.6	103.6	103.6	97.8	97.8	97.8	91.8	91.8	91.8	85.3	85.3	85.3	
			SHC	44.6	62.2	79.9	42.7	60.3	77.9	40.6	58.2	75.8	38.5	56.1	73.6	36.2	53.8	71.3	
		76	THC	–	116.9	116.9	–	111.1	111.1	–	104.9	104.9	–	98.4	98.4	–	91.5	91.5	
			SHC	–	48.8	66.6	–	46.8	64.6	–	44.8	62.6	–	42.7	60.4	–	40.4	58.1	
3750 Cfm	EA (wb)	58	THC	95.1	95.1	107.8	91.2	91.2	103.3	86.9	86.9	98.5	82.3	82.3	93.3	77.4	77.4	87.8	
			SHC	82.4	95.1	107.8	79	91.2	103.3	75.3	86.9	98.5	71.3	82.3	93.3	67.1	77.4	87.8	
		62	THC	95.2	95.2	112.2	91.2	91.2	107.5	87	87	102.5	82.4	82.4	97.1	77.5	77.5	91.3	
			SHC	78.2	95.2	112.2	75	91.2	107.5	71.5	87	102.5	67.7	82.4	97.1	63.7	77.5	91.3	
		67	THC	101.1	101.1	102.6	96	96	100.5	90.6	90.6	98.3	84.9	84.9	95.9	78.9	78.9	93.2	
			SHC	64	83.3	102.6	62	81.2	100.5	59.8	79.1	98.3	57.6	76.7	95.9	55.1	74.2	93.2	
		72	THC	110.4	110.4	110.4	104.8	104.8	104.8	98.9	98.9	98.9	92.7	92.7	92.7	86.1	86.1	86.1	
			SHC	45.7	65.1	84.5	43.7	63.1	82.5	41.7	61	80.4	39.5	58.8	78.2	37.2	56.5	75.9	
		76	THC	–	118.3	118.3	–	112.4	112.4	–	106	106	–	99.4	99.4	–	92.3	92.3	
			SHC	–	50.3	69.9	–	48.3	67.9	–	46.2	65.8	–	44.1	63.6	–	41.8	61.3	

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 17 – COOLING CAPACITIES 2-STAGE COOLING 8.5 TONS

581J*09D				AMBIENT TEMPERATURE																
				85			95			105			115			125		
				EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)		
				75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
2550 Cfm	EA (wb)	58	THC	90.5	90.5	102.4	87	87	98.5	83.2	83.2	94.2	79.1	79.1	89.6	74.7	74.7	84.6
			SHC	78.6	90.5	102.4	75.5	87	98.5	72.2	83.2	94.2	68.7	79.1	89.6	64.8	74.7	84.6
		62	THC	94.8	94.8	98.1	90.2	90.2	95.8	85.4	85.4	93.4	80.3	80.3	90.8	74.9	74.9	87.8
			SHC	71.2	84.6	98.1	69.1	82.4	95.8	66.8	80.1	93.4	64.3	77.5	90.8	61.6	74.7	87.8
		67	THC	104	104	104	99	99	99	93.7	93.7	93.7	88	88	88	81.9	81.9	81.9
			SHC	58.7	72.2	85.7	56.6	70	83.5	54.3	67.8	81.3	52	65.4	78.9	49.5	62.9	76.4
		72	THC	114	114	114	108.5	108.5	108.5	102.7	102.7	102.7	96.5	96.5	96.5	89.8	89.8	89.8
			SHC	45.8	59.3	72.9	43.7	57.2	70.8	41.4	55	68.5	39.1	52.7	66.2	36.7	50.2	63.7
		76	THC	–	122.4	122.4	–	116.5	116.5	–	110.3	110.3	–	103.7	103.7	–	96.5	96.5
			SHC	–	48.8	62.8	–	46.7	60.6	–	44.5	58.4	–	42.2	56	–	39.8	53.5
2975 Cfm	EA (wb)	58	THC	95.4	95.4	108	91.6	91.6	103.7	87.5	87.5	99	83.1	83.1	94	78.3	78.3	88.6
			SHC	82.8	95.4	108	79.5	91.6	103.7	75.9	87.5	99	72.1	83.1	94	68	78.3	88.6
		62	THC	97.7	97.7	107.4	93	93	104.9	88.1	88.1	102.1	83.2	83.2	97.9	78.4	78.4	92.2
			SHC	76.7	92	107.4	74.3	89.6	104.9	71.8	86.9	102.1	68.6	83.2	97.9	64.6	78.4	92.2
		67	THC	106.9	106.9	106.9	101.6	101.6	101.6	96	96	96	90.1	90.1	90.1	83.7	83.7	83.9
			SHC	62.3	77.8	93.4	60.1	75.6	91.2	57.8	73.3	88.9	55.4	70.9	86.5	52.8	68.3	83.9
		72	THC	117	117	117	111.2	111.2	111.2	105.1	105.1	105.1	98.6	98.6	98.6	91.7	91.7	91.7
			SHC	47.3	62.9	78.6	45.1	60.8	76.4	42.9	58.5	74.1	40.5	56.1	71.7	38	53.6	69.2
		76	THC	–	125.6	125.6	–	119.4	119.4	–	112.8	112.8	–	105.9	105.9	–	98.4	98.4
			SHC	–	50.8	66.8	–	48.7	64.6	–	46.4	62.3	–	44.1	59.9	–	41.6	57.4
3400 Cfm	EA (wb)	58	THC	99.5	99.5	112.7	95.4	95.4	108	91	91	103	86.3	86.3	97.7	81.2	81.2	91.9
			SHC	86.4	99.5	112.7	82.8	95.4	108	79	91	103	74.9	86.3	97.7	70.5	81.2	91.9
		62	THC	100.3	100.3	115.8	95.6	95.6	112.4	91.2	91.2	107.2	86.4	86.4	101.6	81.3	81.3	95.6
			SHC	81.5	98.6	115.8	78.7	95.6	112.4	75.1	91.2	107.2	71.2	86.4	101.6	67	81.3	95.6
		67	THC	109.1	109.1	109.1	103.6	103.6	103.6	97.8	97.8	97.8	91.6	91.6	93.7	85	85	90.9
			SHC	65.6	83.2	100.8	63.4	81	98.6	61	78.6	96.2	58.6	76.1	93.7	55.9	73.4	90.9
		72	THC	119.3	119.3	119.3	113.3	113.3	113.3	107	107	107	100.3	100.3	100.3	93	93	93
			SHC	48.7	66.4	84.1	46.5	64.2	81.8	44.2	61.8	79.5	41.8	59.4	77.1	39.2	56.9	74.5
		76	THC	–	128	128	–	121.5	121.5	–	114.7	114.7	–	107.5	107.5	–	99.8	99.8
			SHC	–	52.6	70.6	–	50.5	68.4	–	48.2	66.1	–	45.8	63.6	–	43.3	61.1
3825 Cfm	EA (wb)	58	THC	103	103	116.6	98.7	98.7	111.7	94	94	106.4	89	89	100.8	83.6	83.6	94.7
			SHC	89.4	103	116.6	85.6	98.7	111.7	81.6	94	106.4	77.3	89	100.8	72.6	83.6	94.7
		62	THC	103.1	103.1	121.3	98.8	98.8	116.1	94.1	94.1	110.7	89.1	89.1	104.8	83.7	83.7	98.4
			SHC	85	103.1	121.3	81.4	98.8	116.1	77.5	94.1	110.7	73.4	89.1	104.8	69	83.7	98.4
		67	THC	110.9	110.9	110.9	105.2	105.2	105.7	99.2	99.2	103.2	92.9	92.9	100.5	86.1	86.1	97.6
			SHC	68.8	88.4	108	66.5	86.1	105.7	64.1	83.7	103.2	61.6	81.1	100.5	58.9	78.3	97.6
		72	THC	121.2	121.2	121.2	114.9	114.9	114.9	108.4	108.4	108.4	101.5	101.5	101.5	94.1	94.1	94.1
			SHC	50	69.7	89.4	47.7	67.4	87.1	45.4	65.1	84.7	43	62.6	82.3	40.4	60	79.6
		76	THC	–	129.8	129.8	–	123.2	123.2	–	116.2	116.2	–	108.8	108.8	–	100.9	100.9
			SHC	–	54.4	74.3	–	52.2	72.1	–	49.9	69.7	–	47.5	67.3	–	44.9	64.7
4250 Cfm	EA (wb)	58	THC	106	106	119.9	101.4	101.4	114.8	96.6	96.6	109.3	91.3	91.3	103.4	85.7	85.7	97
			SHC	92	106	119.9	88	101.4	114.8	83.8	96.6	109.3	79.3	91.3	103.4	74.4	85.7	97
		62	THC	106.1	106.1	124.7	101.5	101.5	119.4	96.6	96.6	113.6	91.4	91.4	107.5	85.7	85.7	100.8
			SHC	87.4	106.1	124.7	83.6	101.5	119.4	79.6	96.6	113.6	75.3	91.4	107.5	70.6	85.7	100.8
		67	THC	112.3	112.3	114.9	106.5	106.5	112.5	100.4	100.4	109.9	93.9	93.9	107	87.1	87.1	103.8
			SHC	71.8	93.4	114.9	69.5	91	112.5	67	88.5	109.9	64.4	85.7	107	61.6	82.7	103.8
		72	THC	122.6	122.6	122.6	116.2	116.2	116.2	109.5	109.5	109.5	102.5	102.5	102.5	94.9	94.9	94.9
			SHC	51.2	72.8	94.5	48.9	70.5	92.2	46.6	68.2	89.8	44.1	65.7	87.3	41.5	63.1	84.6
		76	THC	–	131.3	131.3	–	124.5	124.5	–	117.4	117.4	–	109.8	109.8	–	101.8	101.8
			SHC	–	56	77.9	–	53.8	75.6	–	51.5	73.3	–	49.1	70.8	–	46.5	68.1

LEGEND:

– – Do not operate
Cfm – Cubic feet per minute (supply air)
EAT(db) – Entering air temperature (dry bulb)
EAT(wb) – Entering air temperature (wet bulb)
SHC – Sensible heat capacity
TC – Total capacity

TABLE 18 – STATIC PRESSURE ADDERS (FACTORY OPTIONS AND/OR ACCESSORIES)

Economizer

3 – 5 TONS											
CFM (in. wg)	600	800	1000	1250	1500	1750	2000	2250	2500	2750	3000
Vertical Economizer	0.01	0.02	0.04	0.05	0.07	0.09	0.12	0.15	0.18	0.22	0.26
Horizontal Economizer	0.02	0.03	0.04	0.06	0.08	0.10	0.13	0.15	0.18	0.23	0.28

6 – 8.5 TONS																		
CFM (in. wg)	1800	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000
Vertical Economizer	0.04	0.05	0.06	0.08	0.09	0.12	0.13	0.15	0.17	0.20	0.22	0.25	0.29	0.33	0.36	0.40	0.44	0.48
Horizontal Economizer	0.07	0.07	0.08	0.10	0.13	0.15	0.18	0.21	0.25	0.28	0.30	0.34	0.39	0.43	0.47	0.51	0.56	0.60

General fan performance notes:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses, as shown in Table 24. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, Bryant recommended the lower horsepower option.
5. For information on the electrical properties of Bryant motors, please see the Electrical information section of this book.
6. For more information on the performance limits of Bryant motors, see the application data section of this book.
7. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for Bryant 581J04-09 units are exempt from these requirements.

FAN PERFORMANCE (BELT DRIVE)

TABLE 19 – 581J*04--3 PHASE--3 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	**582**	**0.14**	**715**	**0.24**	825	0.35	921	0.48	1007	0.63	1086	0.79	1159	0.96	1228	1.14	1293	1.33	1354	1.53
975	**606**	**0.16**	**735**	**0.26**	843	0.38	938	0.51	1023	0.66	1101	0.82	1174	0.99	1242	1.18	1306	1.37	1367	1.57
1050	**630**	**0.18**	**756**	**0.29**	862	0.41	955	0.55	1040	0.70	1117	0.86	1189	1.03	1256	1.22	1320	1.41	1381	1.62
1125	**655**	**0.21**	778	0.32	882	0.45	974	0.58	1057	0.74	1133	0.90	1204	1.08	1271	1.26	1335	1.46	1395	1.67
1200	**681**	**0.24**	800	0.35	902	0.48	992	0.63	1074	0.78	1150	0.95	1221	1.13	1287	1.31	1350	1.51	1410	1.72
1275	**708**	**0.27**	823	0.39	923	0.53	1012	0.67	1093	0.83	1168	1.00	1237	1.18	1303	1.37	1365	1.57	1425	1.78
1350	**735**	**0.31**	847	0.43	945	0.57	1032	0.72	1112	0.88	1186	1.05	1255	1.24	1320	1.43	1382	1.63	1441	1.84
1425	**762**	**0.35**	871	0.48	967	0.62	1053	0.77	1131	0.94	1204	1.11	1272	1.30	1337	1.49	1398	1.70	1457	1.91
1500	790	0.40	896	0.53	990	0.67	1074	0.83	1151	1.00	1223	1.18	1291	1.36	1355	1.56	1415	1.77	**1473**	**1.99**

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 770–1175 RPM, 1.2 BHP max
* High static 1035–1466 RPM, 2.4 BHP max

TABLE 20 – 581J*04--3 PHASE--3 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	**592**	**0.14**	**721**	**0.25**	826	0.38	916	0.53	997	0.69	1070	0.88	1137	1.07	1201	1.29	1260	1.51	1317	1.75
975	**616**	**0.17**	**744**	**0.28**	847	0.41	936	0.56	1016	0.72	1089	0.91	1156	1.11	1219	1.32	1279	1.54	1335	1.78
1050	**641**	**0.19**	**766**	**0.30**	868	0.44	957	0.59	1036	0.76	1108	0.94	1175	1.14	1238	1.36	1297	1.58	1353	1.82
1125	**667**	**0.22**	790	0.33	890	0.47	978	0.63	1056	0.80	1128	0.98	1195	1.18	1257	1.40	1316	1.62	1372	1.86
1200	**693**	**0.25**	813	0.37	913	0.51	999	0.67	1077	0.84	1148	1.03	1214	1.23	1276	1.44	1335	1.67	1391	1.91
1275	**720**	**0.29**	837	0.41	935	0.55	1021	0.71	1098	0.88	1169	1.07	1235	1.28	1296	1.50	1354	1.72	1410	1.97
1350	**747**	**0.33**	862	0.45	958	0.60	1043	0.76	1119	0.94	1190	1.13	1255	1.33	1316	1.55	1374	1.78	1429	2.03
1425	775	0.37	887	0.50	982	0.65	1066	0.81	1141	0.99	1211	1.19	1276	1.39	1337	1.61	1394	1.85	1449	2.09
1500	802	0.42	912	0.55	1006	0.70	1088	0.87	1163	1.05	1232	1.25	1297	1.46	1357	1.68	1415	1.91	**1469**	**2.16**

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 770–1175 RPM,, 1.2 BHP max
* High static 1035–1466 RPM, 2.4 BHP max

FAN PERFORMANCE (BELT DRIVE) (cont.)

TABLE 21 – 581J*05--3 PHASE--4 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	**681**	**0.24**	**800**	**0.35**	**902**	**0.48**	992	0.63	1074	0.78	1150	0.95	1221	1.13	1287	1.31	1350	1.51	1410	1.72
1300	**717**	**0.29**	**831**	**0.41**	930	0.54	1019	0.69	1099	0.85	1173	1.02	1243	1.20	1309	1.39	1371	1.59	1430	1.80
1400	**753**	**0.34**	**863**	**0.46**	959	0.60	1046	0.75	1125	0.92	1198	1.09	1266	1.28	1331	1.47	1393	1.68	1451	1.89
1500	**790**	**0.40**	**896**	**0.53**	990	0.67	1074	0.83	1151	1.00	1223	1.18	1291	1.36	1355	1.56	1415	1.77	1473	1.99
1600	**828**	**0.46**	930	0.60	1021	0.75	1103	0.91	1179	1.09	1249	1.27	1316	1.46	1379	1.66	1439	1.87	1496	2.09
1700	**866**	**0.54**	964	0.68	1053	0.84	1133	1.01	1207	1.18	1277	1.37	1342	1.57	1404	1.77	1463	1.99	1520	2.21
1800	**905**	**0.62**	1000	0.77	1085	0.94	1164	1.11	1236	1.29	1305	1.48	1369	1.68	1430	1.89	1489	2.11	1545	2.34
1900	944	0.71	1036	0.87	1119	1.04	1195	1.22	1266	1.41	1333	1.60	1397	1.81	1457	2.02	1514	2.25	1570	2.48
2000	984	0.82	1072	0.98	1153	1.15	1227	1.34	1297	1.53	1363	1.73	1425	1.94	1484	2.16	1541	2.39	1596	2.63

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 920–1303 RPM, 1.7 BHP max
* High static 1208–1639 RPM, 2.9 BHP max

TABLE 22 – 581J*05--3 PHASE--4 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	**693**	**0.25**	**813**	**0.37**	**913**	**0.51**	999	0.67	1077	0.84	1148	1.03	1214	1.23	1276	1.44	1335	1.67	1391	1.91
1300	**729**	**0.30**	**846**	**0.42**	943	0.57	1028	0.73	1105	0.90	1176	1.09	1241	1.30	1303	1.51	1361	1.74	1416	1.98
1400	**765**	**0.35**	**879**	**0.48**	974	0.63	1058	0.79	1134	0.97	1204	1.17	1269	1.37	1330	1.59	1388	1.82	1442	2.07
1500	**802**	**0.42**	**912**	**0.55**	1006	0.70	1088	0.87	1163	1.05	1232	1.25	1297	1.46	1357	1.68	1415	1.91	1469	2.16
1600	**840**	**0.49**	947	0.63	1038	0.78	1119	0.95	1193	1.14	1262	1.34	1325	1.55	1385	1.78	1442	2.01	1496	2.26
1700	**878**	**0.57**	982	0.71	1071	0.87	1151	1.05	1224	1.24	1291	1.44	1354	1.66	1414	1.89	1470	2.12	1524	2.37
1800	**917**	**0.65**	1017	0.81	1105	0.97	1183	1.15	1255	1.35	1322	1.55	1384	1.77	1443	2.00	1499	2.25	1552	2.50
1900	956	0.75	1053	0.91	1139	1.08	1216	1.27	1287	1.47	1352	1.68	1414	1.90	1472	2.13	1528	2.38	1580	2.63
2000	995	0.86	1090	1.02	1173	1.20	1249	1.39	1319	1.59	1384	1.81	1445	2.04	1502	2.27	1557	2.52	1609	2.78

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 920–1303 RPM, 1.7 BHP max
* High static 1208–1639 RPM, 2.9 BHP max

FAN PERFORMANCE BELT DRIVE (cont.)

TABLE 23 – 581J*06--3 PHASE--5 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	**798**	**0.41**	906	0.55	1002	0.71	1088	0.87	1167	1.05	1241	1.23	1310	1.42	1375	1.63	1438	1.84	1497	2.06
1625	**845**	**0.50**	949	0.65	1041	0.81	1125	0.98	1202	1.17	1274	1.36	1342	1.56	1406	1.77	1467	1.98	1526	2.21
1750	**893**	**0.60**	993	0.76	1081	0.93	1163	1.11	1238	1.30	1308	1.50	1375	1.70	1438	1.92	1498	2.14	1555	2.37
1875	**942**	**0.71**	1037	0.88	1123	1.06	1202	1.25	1275	1.44	1344	1.65	1409	1.86	1471	2.09	1530	2.32	1586	2.55
2000	**992**	**0.84**	1083	1.02	1166	1.21	1242	1.40	1313	1.61	1380	1.82	1444	2.04	1505	2.27	1563	2.51	1619	2.75
2125	1043	0.98	1129	1.17	1209	1.37	1283	1.57	1353	1.79	1418	2.01	1481	2.24	1540	2.47	1597	2.72	**1652**	**2.97**
2250	1093	1.14	1177	1.34	1254	1.55	1325	1.76	1393	1.98	1457	2.21	1518	2.45	1576	2.69	**1632**	**2.94**	**1686**	**3.20**
2375	1145	1.32	1225	1.53	1299	1.74	1369	1.97	1434	2.20	1497	2.43	1556	2.68	**1614**	**2.93**	**1669**	**3.19**	–	–
2500	1196	1.51	1273	1.73	1345	1.96	1413	2.19	1477	2.43	1538	2.68	**1596**	**2.93**	**1652**	**3.19**	–	–	–	–

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 1035–1466 RPM, 2.4 BHP
* High static 1303 – 1687 RPM, 2.9 BHP max

TABLE 24 – 581J*06--3 PHASE--5 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	**847**	0.41	966	0.55	1067	0.68	1158	0.81	1240	0.93	1316	1.05	1387	1.17	1454	1.28	1517	1.39	1578	1.50
1625	**896**	0.50	1010	0.65	1109	0.79	1198	0.93	1278	1.07	1353	1.20	1423	1.33	1489	1.46	1552	1.58	1611	1.70
1750	**947**	0.59	1056	0.76	1152	0.92	1238	1.07	1318	1.22	1391	1.36	1460	1.51	1525	1.65	1587	1.78	1646	1.91
1875	**998**	0.70	1103	0.88	1196	1.05	1280	1.22	1358	1.38	1430	1.54	1498	1.70	1562	1.85	1623	2.00	1681	2.14
2000	1049	0.82	1151	1.02	1241	1.20	1323	1.38	1399	1.56	1470	1.73	1537	1.90	1600	2.06	1660	2.23	**1718**	**2.38**
2125	1102	0.96	1199	1.17	1287	1.37	1367	1.56	1441	1.75	1511	1.93	1576	2.12	1639	2.29	**1698**	**2.47**	**1755**	**2.64**
2250	1154	1.11	1248	1.33	1333	1.55	1411	1.75	1484	1.96	1552	2.15	1617	2.35	1678	2.54	**1737**	**2.73**	1793	2.92
2375	1208	1.28	1298	1.52	1381	1.74	1457	1.96	1528	2.18	1595	2.39	1658	2.60	**1718**	**2.80**	1776	3.01	–	–
2500	1261	1.47	1349	1.72	1429	1.96	1503	2.19	1572	2.42	1638	2.64	**1700**	**2.87**	1760	3.08	–	–	–	–

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Medium static 1035–1466 RPM, 2.4 BHP
* High static 1303 – 1687 RPM, 2.9 BHP max

FAN PERFORMANCE (cont.)

TABLE 25 – 581J*07--3 PHASE--6 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	**441**	**0.33**	533	0.51	611	0.72	681	0.96	745	1.23	804	1.51	860	1.82	912	2.15	961	2.49	1008	2.85
1950	**462**	**0.38**	550	0.58	626	0.80	694	1.04	757	1.31	815	1.60	869	1.91	920	2.24	969	2.59	1016	2.96
2100	**483**	**0.45**	567	0.65	641	0.88	708	1.13	769	1.40	826	1.70	880	2.01	930	2.35	978	2.70	1024	3.07
2250	505	0.52	586	0.73	657	0.97	722	1.22	782	1.50	838	1.81	891	2.12	941	2.46	988	2.82	1033	3.19
2400	528	0.60	605	0.82	674	1.07	738	1.33	796	1.62	851	1.92	903	2.25	952	2.59	999	2.95	1043	3.33
2550	550	0.69	625	0.92	692	1.17	754	1.45	811	1.74	865	2.05	916	2.38	964	2.73	1010	3.10	1054	3.48
2700	574	0.80	645	1.03	710	1.29	770	1.57	826	1.88	879	2.19	929	2.53	976	2.88	1022	3.25	1066	3.64
2850	597	0.91	666	1.16	729	1.43	788	1.71	843	2.02	894	2.35	943	2.69	990	3.05	1035	3.43	1078	3.82
3000	621	1.03	688	1.29	749	1.57	806	1.87	859	2.18	910	2.51	958	2.86	1004	3.23	1048	3.61	1090	4.01

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 489 – 747 RPM, 1.7 BHP max
* Medium static 733 – 949 RPM, 2.9 BHP max
* High static 909 – 1102 RPM, 4.7 BHP max

TABLE 26 – 581J*07--3 PHASE--6 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	**449**	**0.34**	539	0.53	615	0.75	681	0.99	742	1.26	797	1.54	848	1.84	896	2.16	942	2.49	985	2.84
1950	**470**	**0.40**	557	0.60	631	0.83	696	1.08	756	1.35	810	1.64	861	1.94	909	2.26	954	2.60	997	2.96
2100	491	0.47	576	0.68	648	0.91	712	1.17	771	1.45	824	1.74	875	2.06	922	2.38	967	2.73	1009	3.09
2250	513	0.54	595	0.76	665	1.01	728	1.27	786	1.56	839	1.86	889	2.18	935	2.52	980	2.87	1022	3.23
2400	536	0.63	615	0.86	684	1.11	745	1.39	802	1.68	854	1.99	903	2.32	950	2.66	993	3.02	1035	3.39
2550	558	0.72	635	0.97	702	1.23	763	1.51	818	1.81	870	2.13	918	2.46	964	2.81	1008	3.18	1049	3.55
2700	582	0.83	656	1.08	721	1.35	781	1.65	835	1.95	886	2.28	934	2.62	979	2.98	1022	3.35	1063	3.74
2850	605	0.94	677	1.21	741	1.49	799	1.79	853	2.11	903	2.44	950	2.79	995	3.16	1037	3.54	1078	3.93
3000	629	1.07	699	1.35	761	1.64	818	1.95	871	2.28	920	2.62	966	2.98	1010	3.35	1052	3.74	1093	4.14

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 489 – 747 RPM, 1.7 BHP max
* Medium static 733 – 949 RPM, 2.9 BHP max
* High static 909 – 1102 RPM, 4.7 BHP max

FAN PERFORMANCE BELT DRIVE(cont.)

TABLE 27 – 581J*08--3 PHASE--7.5 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	482	0.36	577	0.51	659	0.66	732	0.82	799	0.98	860	1.14	917	1.31	971	1.48	1022	1.66	1071	1.84
2438	505	0.43	597	0.59	676	0.75	748	0.92	813	1.09	873	1.27	929	1.45	983	1.63	1033	1.81	1081	2.00
2625	529	0.51	617	0.68	694	0.85	764	1.03	827	1.22	887	1.40	942	1.59	995	1.78	1045	1.98	1092	2.18
2813	554	0.60	638	0.78	713	0.97	781	1.16	843	1.35	901	1.55	956	1.75	1008	1.95	1057	2.15	1104	2.36
3000	579	0.70	660	0.89	732	1.09	799	1.29	860	1.50	917	1.70	970	1.91	1021	2.13	1070	2.34	1117	2.56
3188	604	0.81	683	1.02	753	1.23	817	1.44	877	1.65	933	1.87	986	2.09	1036	2.32	1084	2.54	1130	2.77
3375	630	0.94	706	1.15	774	1.37	836	1.60	895	1.82	950	2.05	1002	2.29	1051	2.52	1098	2.76	1144	3.00
3563	657	1.08	729	1.31	795	1.54	856	1.77	913	2.01	967	2.25	1018	2.49	1067	2.74	1113	2.99	1158	3.24
3750	683	1.23	753	1.47	817	1.71	877	1.96	933	2.21	985	2.46	1035	2.71	1083	2.97	1129	3.23	1173	3.49

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 518 – 733 RPM, 1.7 BHP max
* Medium static 690 – 936 RPM, 2.4 BHP max
* High static 838 – 1084 RPM, 3.7 BHP max

TABLE 28 – 581J*08--3 PHASE--7.5 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	505	0.39	595	0.54	676	0.69	750	0.86	819	1.03	884	1.21	945	1.40	1003	1.60	1059	1.80	1112	2.01
2438	532	0.47	617	0.63	694	0.79	766	0.97	833	1.15	896	1.34	955	1.54	1012	1.74	1066	1.95	1118	2.17
2625	559	0.56	640	0.73	714	0.90	783	1.08	848	1.28	909	1.47	967	1.68	1022	1.89	1075	2.11	1126	2.34
2813	588	0.67	664	0.84	735	1.03	801	1.22	864	1.42	923	1.62	980	1.84	1034	2.06	1086	2.29	1136	2.52
3000	616	0.79	689	0.97	757	1.16	821	1.36	882	1.57	939	1.79	994	2.01	1047	2.24	1098	2.47	1147	2.71
3188	646	0.92	715	1.11	780	1.31	842	1.52	901	1.74	956	1.97	1010	2.20	1061	2.43	1111	2.68	1159	2.93
3375	675	1.06	742	1.27	804	1.48	864	1.70	920	1.93	975	2.16	1027	2.40	1077	2.65	1125	2.90	1172	3.15
3563	705	1.23	769	1.44	829	1.66	886	1.89	941	2.13	994	2.37	1044	2.62	1093	2.87	1141	3.13	1186	3.40
3750	736	1.41	797	1.63	855	1.86	910	2.10	963	2.35	1014	2.60	1063	2.86	1111	3.12	1157	3.39	1202	3.66

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 518 – 733 RPM, 1.7 BHP max
* Medium static 690 – 936 RPM, 2.4 BHP max
* High static 838 – 1084 RPM, 3.7 BHP max

FAN PERFORMANCE BELT DRIVE(cont.)

TABLE 29 – 581J*09--3 PHASE--8.5 TON HORIZONTAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	520	0.47	609	0.64	687	0.81	757	0.99	821	1.16	881	1.35	937	1.53	990	1.72	1040	1.91	1088	2.11
2438	547	0.57	633	0.75	708	0.94	776	1.12	839	1.31	897	1.51	952	1.70	1004	1.90	1054	2.11	1101	2.31
2625	575	0.68	657	0.88	730	1.07	796	1.27	857	1.48	915	1.68	968	1.89	1020	2.10	1068	2.32	1115	2.53
2813	604	0.81	683	1.02	753	1.23	817	1.44	877	1.65	933	1.87	986	2.09	1036	2.32	1084	2.54	1130	2.77
3000	634	0.95	709	1.17	777	1.40	839	1.62	897	1.85	952	2.08	1004	2.31	1053	2.55	1100	2.79	1145	3.03
3188	664	1.11	736	1.35	801	1.58	862	1.82	919	2.06	972	2.30	1023	2.55	1071	2.80	1118	3.05	1162	3.30
3375	694	1.29	763	1.54	826	1.79	885	2.04	941	2.29	993	2.55	1043	2.81	1090	3.07	1136	3.33	1179	3.59
3563	725	1.49	791	1.75	852	2.01	909	2.28	963	2.54	1014	2.81	1063	3.08	1110	3.36	1154	3.63	1198	3.91
3750	756	1.71	819	1.98	879	2.26	934	2.53	987	2.81	1037	3.09	1084	3.38	1130	3.66	1174	3.95	1216	4.24

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 518 – 733 RPM, 1.7 BHP max
* Medium static 690 – 936 RPM, 2.4 BHP max
* High static 838 – 1084 RPM, 3.7 BHP max

TABLE 30 – 581J*09--3 PHASE--8.5 TON VERTICAL SUPPLY

CFM	Available External Static Pressure (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	505	0.39	595	0.54	676	0.69	750	0.86	819	1.03	884	1.21	945	1.40	1003	1.60	1059	1.80	1112	2.01
2438	532	0.47	617	0.63	694	0.79	766	0.97	833	1.15	896	1.34	955	1.54	1012	1.74	1066	1.95	1118	2.17
2625	559	0.56	640	0.73	714	0.90	783	1.08	848	1.28	909	1.47	967	1.68	1022	1.89	1075	2.11	1126	2.34
2813	588	0.67	664	0.84	735	1.03	801	1.22	864	1.42	923	1.62	980	1.84	1034	2.06	1086	2.29	1136	2.52
3000	616	0.79	689	0.97	757	1.16	821	1.36	882	1.57	939	1.79	994	2.01	1047	2.24	1098	2.47	1147	2.71
3188	646	0.92	715	1.11	780	1.31	842	1.52	901	1.74	956	1.97	1010	2.20	1061	2.43	1111	2.68	1159	2.93
3375	675	1.06	742	1.27	804	1.48	864	1.70	920	1.93	975	2.16	1027	2.40	1077	2.65	1125	2.90	1172	3.15
3563	705	1.23	769	1.44	829	1.66	886	1.89	941	2.13	994	2.37	1044	2.62	1093	2.87	1141	3.13	1186	3.40
3750	736	1.41	797	1.63	855	1.86	910	2.10	963	2.35	1014	2.60	1063	2.86	1111	3.12	1157	3.39	1202	3.66

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
* Standard static 518 – 733 RPM, 1.7 BHP max
* Medium static 690 – 936 RPM, 2.4 BHP max
* High static 838 – 1084 RPM, 3.7 BHP max

FAN PERFORMANCE
X13 MULTI SPEED/TORQUE MOTOR (cont.)

TABLE 31 – 581J*04A Horizontal Unit-Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	900	0.45	0.23
	975	0.33	0.22
	1050	0.22	0.20
	1125	0.12	0.19
	1200	0.05	0.17
	1275	–	–
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.66	0.30
	975	0.52	0.28
	1050	0.39	0.27
	1125	0.27	0.26
	1200	0.16	0.24
	1275	0.05	0.23
	1350	–	–
	1425	–	–
	1500	–	–
3	900	1.01	0.43
	975	0.88	0.41
	1050	0.73	0.39
	1125	0.59	0.38
	1200	0.46	0.36
	1275	0.33	0.36
	1350	0.21	0.33
	1425	0.09	0.31
	1500	–	–
4	900	1.13	0.46
	975	1.03	0.46
	1050	0.92	0.46
	1125	0.81	0.46
	1200	0.69	0.46
	1275	0.57	0.45
	1350	0.44	0.44
	1425	0.31	0.42
	1500	0.18	0.40
5	900	1.20	0.49
	975	1.14	0.51
	1050	0.92	0.53
	1125	0.81	0.55
	1200	0.95	0.57
	1275	0.90	0.60
	1350	0.84	0.62
	1425	0.78	0.65
	1500	0.72	0.68

TABLE 32 – 581J*04A Vertical Unit-Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	900	0.30	0.19
	975	0.17	0.17
	1050	0.06	0.16
	1125	–	–
	1200	–	–
	1275	–	–
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.48	0.25
	975	0.34	0.23
	1050	0.20	0.22
	1125	0.07	0.20
	1200	–	–
	1275	–	–
	1350	–	–
	1425	–	–
	1500	–	–
3	900	0.84	0.38
	975	0.69	0.36
	1050	0.53	0.33
	1125	0.38	0.32
	1200	0.24	0.31
	1275	0.10	0.31
	1350	–	–
	1425	–	–
	1500	–	–
4	900	0.99	0.43
	975	0.88	0.43
	1050	0.75	0.43
	1125	0.61	0.43
	1200	0.47	0.42
	1275	0.33	0.40
	1350	0.19	0.38
	1425	–	–
	1500	–	–
5	900	1.10	0.47
	975	1.02	0.49
	1050	0.75	0.51
	1125	0.61	0.54
	1200	0.81	0.56
	1275	0.74	0.58
	1350	0.67	0.61
	1425	0.60	0.63
	1500	0.52	0.66

TABLE 33 – 581J*05A Horizontal Unit-Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1200	0.49	0.35
	1300	0.34	0.33
	1400	0.20	0.31
	1500	0.06	0.29
	1600	–	–
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
2	1200	0.60	0.40
	1300	0.45	0.38
	1400	0.30	0.36
	1500	0.16	0.34
	1600	0.01	0.32
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
3	1200	0.94	0.59
	1300	0.83	0.61
	1400	0.71	0.63
	1500	0.59	0.61
	1600	0.46	0.59
	1700	0.33	0.56
	1800	0.19	0.53
	1900	0.07	0.49
	2000	–	–
4	1200	0.98	0.59
	1300	0.89	0.62
	1400	0.81	0.65
	1500	0.72	0.66
	1600	0.62	0.67
	1700	0.52	0.68
	1800	0.40	0.68
	1900	0.27	0.66
	2000	0.12	0.61
5	1200	1.02	0.60
	1300	0.95	0.63
	1400	0.81	0.67
	1500	0.72	0.70
	1600	0.74	0.74
	1700	0.67	0.78
	1800	0.59	0.82
	1900	0.51	0.86
	2000	0.42	0.89

TABLE 34 – 581J*05A Vertical Unit-Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1200	0.38	0.30
	1300	0.24	0.28
	1400	0.12	0.27
	1500	0.01	0.26
	1600	–	–
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
2	1200	0.49	0.34
	1300	0.34	0.32
	1400	0.20	0.31
	1500	0.05	0.29
	1600	–	–
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
3	1200	0.87	0.56
	1300	0.74	0.57
	1400	0.60	0.59
	1500	0.44	0.56
	1600	0.29	0.50
	1700	0.14	0.47
	1800	0.02	0.46
	1900	–	–
	2000	–	–
4	1200	0.93	0.57
	1300	0.83	0.60
	1400	0.72	0.63
	1500	0.60	0.63
	1600	0.48	0.62
	1700	0.35	0.62
	1800	0.21	0.61
	1900	0.06	0.58
	2000	–	–
5	1200	0.97	0.58
	1300	0.89	0.61
	1400	0.72	0.65
	1500	0.60	0.68
	1600	0.64	0.72
	1700	0.55	0.75
	1800	0.46	0.79
	1900	0.35	0.82
	2000	0.25	0.86

TABLE 35 – 581J*06A Horizontal Unit-Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1500	0.40	0.50
	1625	0.20	0.48
	1750	0.04	0.45
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.62	0.62
	1625	0.39	0.60
	1750	0.19	0.57
	1875	0.03	0.53
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	1.04	0.87
	1625	0.87	0.88
	1750	0.68	0.88
	1875	0.48	0.84
	2000	0.28	0.84
	2125	0.07	0.84
	2250	–	–
	2375	–	–
	2500	–	–
4	1500	1.10	0.90
	1625	0.96	0.94
	1750	0.81	0.98
	1875	0.65	0.95
	2000	0.47	1.00
	2125	0.27	0.94
	2250	0.05	0.96
	2375	–	–
	2500	–	–
5	1500	1.12	0.92
	1625	1.00	0.96
	1750	0.81	1.00
	1875	0.65	1.04
	2000	0.56	1.08
	2125	0.39	0.95
	2250	0.19	1.09
	2375	–	–
	2500	–	–

TABLE 36 – 581J*06A Vertical Unit-Direct Drive

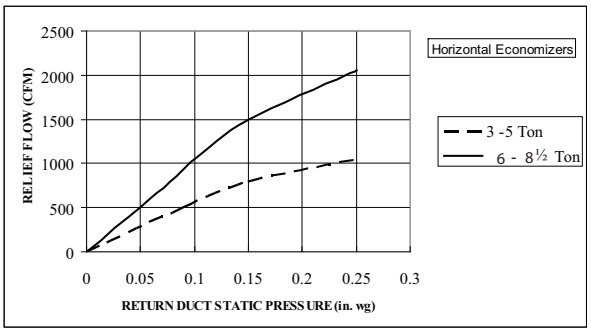
Speed (Torque) tap	CFM	ESP	BHP
1	1500	0.27	0.45
	1625	0.08	0.43
	1750	–	–
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.48	0.57
	1625	0.26	0.55
	1750	0.08	0.53
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	0.91	0.82
	1625	0.72	0.82
	1750	0.52	0.81
	1875	0.31	0.78
	2000	0.11	0.77
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
4	1500	0.98	0.85
	1625	0.82	0.89
	1750	0.66	0.92
	1875	0.50	0.90
	2000	0.32	0.92
	2125	0.13	0.86
	2250	–	–
	2375	–	–
	2500	–	–
5	1500	1.00	–
	1625	0.86	0.91
	1750	0.66	0.95
	1875	0.50	0.98
	2000	0.41	1.01
	2125	0.25	0.88
	2250	0.06	1.01
	2375	–	–
	2500	–	–

TABLE 37 – PULLEY ADJUSTMENT

UNIT		Motor/Drive Combo	Motor Pulley turns open										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
04	3 Phase	Medium Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
05	3 Phase	Medium Static	1303	1265	1226	1188	1150	1112	1073	1035	997	958	920
		High Static	1639	1596	1553	1510	1467	1424	1380	1337	1294	1251	1208
06	3 Phase	Medium Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
		High Static	1687	1649	1610	1572	1533	1495	1457	1418	1380	1341	1303
07	3 Phase	Standard Static	747	721	695	670	644	618	592	566	541	515	489
		Medium Static	949	927	906	884	863	841	819	798	776	755	733
		High Static	1102	1083	1063	1044	1025	1006	986	967	948	928	909
08	3 Phase	Standard Static	733	712	690	669	647	626	604	583	561	540	518
		Medium Static	936	911	887	862	838	813	788	764	739	715	690
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
09	3 Phase	Standard Static	733	712	690	669	647	626	604	583	561	540	518
		Medium Static	936	911	887	862	838	813	788	764	739	715	690
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838

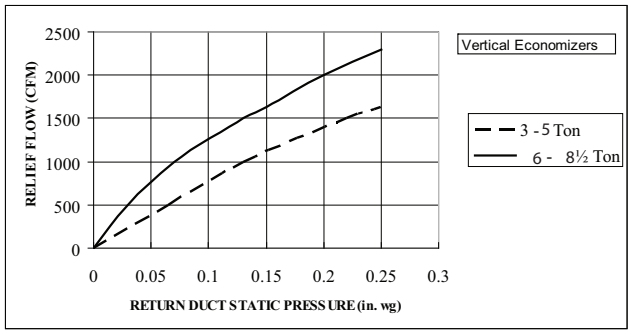
– Factory settings

ECONOMIZER, BAROMETRIC RELIEF AND PE PERFORMANCE



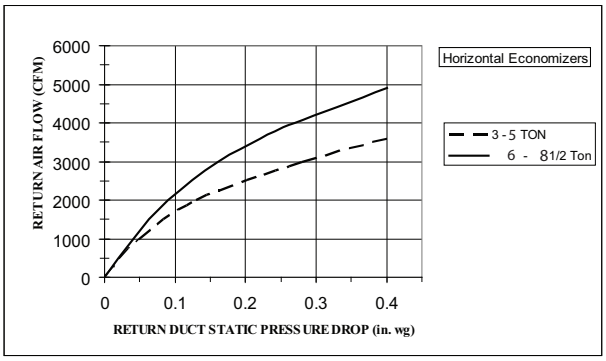
C10233

Fig. 9 - Barometric Relief Flow Capacity



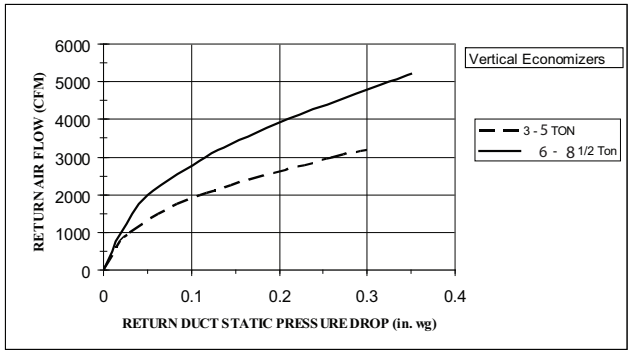
C10236

Fig. 12 - Barometric Relief Flow Capacity



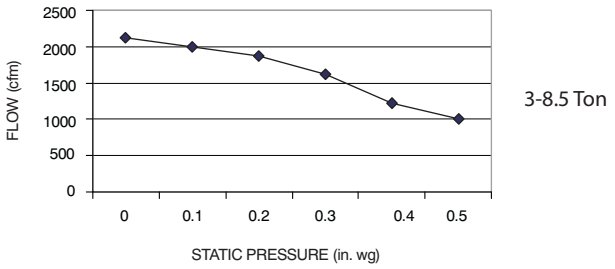
C10235

Fig. 10 - Return Air Pressure Drop



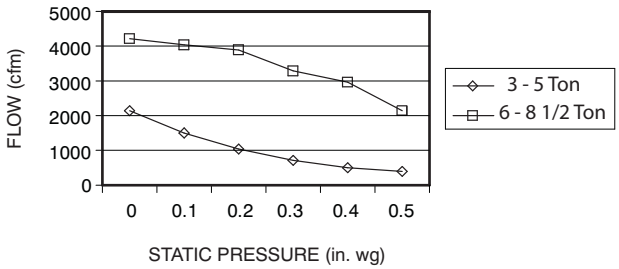
C10238

Fig. 13 - Return Air Pressure Drop



C10239

Fig. 11 - Horizontal Power Exhaust Performance



C10240

Fig. 14 - Vertical Power Exhaust Performance

ELECTRICAL INFORMATION

TABLE 38 – 581J*04A--1-STAGE COOLING--3 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	16.6	79	190	1.0	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	16.6	79	190	1.0	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	10.4	73	190	1.0	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
230–3–60	187	253	10.4	73	190	1.0	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
460–3–60	414	506	5.8	38	190	0.5	DD–STD	980	4.2	84%	4.0
							MED	1000	2.2	70%	2.1
							HIGH	2120	2.7	80%	2.6
575–3–60	518	633	3.8	37	190	0.5	DD–STD	980	4.2	84%	4.0
							MED	1000	2.0	71%	1.9
							HIGH	2120	2.1	80%	2.0

TABLE 39 – 581J*05A--1-STAGE COOLING--4 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	21.8	117	325	1.4	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	21.8	117	325	1.4	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	13.7	83	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
230–3–60	187	253	13.7	83	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
460–3–60	414	506	6.2	41	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1000	2.2	70%	2.1
							HIGH	2120	2.7	80%	2.6
575–3–60	518	633	4.8	37	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1000	2.0	71%	1.9
							HIGH	2120	2.1	80%	2.0

ELECTRICAL INFORMATION (CON'T)

TABLE 40 – 581J*06A--1-STAGE COOLING--5 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	25.0	134	325	1.4	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	25.0	134	325	1.4	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	15.9	110	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	2120	5.5	80%	5.2
							HIGH	2615	7.9	81%	7.5
230–3–60	187	253	15.9	110	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	2120	5.5	80%	5.2
							HIGH	2615	7.9	81%	7.5
460–3–60	414	506	7.0	52	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	2120	2.7	80%	2.6
							HIGH	2615	3.6	81%	3.4
575–3–60	518	633	5.1	40	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1390	2.1	81%	2.0
							HIGH	3775	2.9	81%	2.8

TABLE 41 – 581J*07A--1-STAGE COOLING--6 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	19.0	123	325	1.5	STD	2120	5.5	80%	5.2
							MED	2615	7.9	81%	7.5
							HIGH	2615	15.8	81%	15.0
230–3–60	187	253	19.0	123	325	1.5	STD	2120	5.5	80%	5.2
							MED	2615	7.9	81%	7.5
							HIGH	2615	15.8	81%	15.0
460–3–60	414	506	9.7	62	325	0.8	STD	2120	2.7	80%	2.6
							MED	2615	3.6	81%	3.4
							HIGH	3775	7.8	81%	7.4
575–3–60	518	633	7.4	50	325	0.6	STD	2120	2.5	80%	2.4
							MED	3775	2.9	81%	2.8
							HIGH	3775	5.9	81%	5.6

ELECTRICAL INFORMATION (CON'T)

TABLE 42 – 581J*08D--2-STAGE COOLING--7.5 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	13.6	83	13.6	83	325	1.5	STD	1448	5.5	80%	5.2
									MED	2278	7.9	81%	7.5
									HIGH	4400	15.0	81%	15.0
230–3–60	187	253	13.6	83	13.6	83	325	1.5	STD	1448	5.5	80%	5.2
									MED	2278	7.9	81%	7.5
									HIGH	4400	15.0	81%	15.0
460–3–60	414	506	6.1	41	6.1	41	325	0.8	STD	1448	2.7	80%	2.6
									MED	2278	3.6	81%	3.4
									HIGH	4400	7.4	81%	7.4
575–3–60	518	633	4.2	33	4.2	33	325	0.6	STD	1379	2.5	80%	2.4
									MED	3775	2.9	81%	2.8
									HIGH	4400	5.9	81%	5.6

TABLE 43 – 581J*09D--2-STAGE COOLING--8.5 TONS

V–Ph–Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM				
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	13.7	83	13.7	83	325	1.5	STD	1448	5.46	80%	5.2
									MED	2120	5.46	80%	5.2
									HIGH	2694	10.5	80%	10.0
230–3–60	187	253	13.7	83	13.7	83	325	1.5	STD	1448	5.46	80%	5.2
									MED	2120	5.46	80%	5.2
									HIGH	2694	10.5	80%	10.0
460–3–60	414	506	6.2	41	6.2	41	325	0.8	STD	1448	2.73	80%	2.6
									MED	2120	2.73	80%	2.6
									HIGH	2694	4.62	80%	4.4
575–3–60	518	633	4.8	37	4.8	37	325	0.6	STD	1379	2.52	80%	2.4
									MED	1390	2.1	80%	2.0
									HIGH	3775	2.94	81%	2.8

MCA/MOCP

TABLE 44 – MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O.-3-5 TON

UNIT	v–pH–hZ	IFM	COMBUST FAN MOTOR	PWR EXHAUST	NO C.O. or UNPWR C.O.							
					NO P.E.				w/ P.E. (pwrd fr/ unit)			
		TYPE	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
							FLA	LRA			FLA	LRA
04	208/230–1–60	DD–STD	0.48	1.9	29.2	45	29	88	31.1	45	31	90
	208/230–3–60	DD–STD	0.48	1.9	21.4	30	22	82	23.3	30	24	84
		MED			18.9	25	19	87	20.8	30	21	89
		HIGH			19.2	25	19	105	21.1	30	21	107
	460–3–60	DD–STD	0.25	1.0	11.8	15	12	43	12.8	15	13	44
		MED			9.9	15	10	45	10.9	15	11	46
		HIGH			10.4	15	10	54	11.4	15	11	55
	575–3–60	DD–STD	0.24	1.9	9.3	15	10	42	11.2	15	12	44
		MED			7.2	15	7	43	9.1	15	9	45
		HIGH			7.3	15	7	49	9.2	15	9	51
05	208/230–1–60	DD–STD	0.48	1.9	36.1	50	35	127	38.0	50	37	129
	208/230–3–60	DD–STD	0.48	1.9	25.9	30	26	93	27.8	40	28	95
		MED			23.4	30	23	98	25.3	30	25	100
		HIGH			23.7	30	23	116	25.6	30	26	118
	460–3–60	DD–STD	0.25	1.0	12.7	15	13	47	13.7	20	14	48
		MED			10.8	15	11	49	11.8	15	12	50
		HIGH			11.3	15	11	58	12.3	15	12	59
	575–3–60	DD–STD	0.24	1.9	10.9	15	11	43	12.8	15	13	45
		MED			8.8	15	9	44	10.7	15	11	46
		HIGH			8.9	15	9	50	10.8	15	11	52
06	208/230–1–60	DD–STD	0.48	1.9	40.1	60	39	144	42.0	60	41	146
	208/230–3–60	DD–STD	0.48	1.9	28.7	40	28	120	30.6	45	31	122
		MED			26.5	40	26	143	28.4	40	28	145
		HIGH			28.8	40	29	169	30.7	45	31	171
	460–3–60	DD–STD	0.25	1.0	13.7	20	14	58	14.7	20	15	59
		MED			12.3	15	12	69	13.3	20	13	70
		HIGH			13.1	20	13	82	14.1	20	14	83
	575–3–60	DD–STD	0.24	1.9	11.3	15	12	46	13.2	15	14	48
		MED			9.3	15	9	53	11.2	15	11	55
		HIGH			10.1	15	10	64	12.0	15	12	66

MCA/MOCP (CON'T)

TABLE 45 – MCA/MOCP DETERMINATION WITH POWERED CONVENIENCE OUTLET-3-5 TON

UNIT	v–pH–hZ	IFM	COMBUST FAN MOTOR	PWR EXHAUST	w/ PWRD C.O.							
					NO P.E.				w/ P.E. (pwrd fr/ unit)			
		TYPE	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
							FLA	LRA			FLA	LRA
04	208/230–1–60	DD–STD	0.48	1.9	34.0	50	34	93	35.9	50	36	95
	208/230–3–60	DD–STD	0.48	1.9	26.2	30	27	87	28.1	35	29	89
		MED			23.7	30	24	92	25.6	30	26	94
		HIGH			24.0	30	25	110	25.9	30	27	112
	460–3–60	DD–STD	0.25	1.0	14.0	20	14	45	15.0	20	16	46
		MED			12.1	15	12	47	13.1	15	13	48
		HIGH			12.6	15	13	56	13.6	20	14	57
	575–3–60	DD–STD	0.24	1.9	11.0	15	12	44	12.9	15	14	46
		MED			8.9	15	9	45	10.8	15	11	47
		HIGH			9.0	15	9	51	10.9	15	11	53
05	208/230–1–60	DD–STD	0.48	1.9	40.9	60	41	132	42.8	60	43	134
	208/230–3–60	DD–STD	0.48	1.9	30.7	40	31	98	32.6	45	34	100
		MED			28.2	40	29	103	30.1	40	31	105
		HIGH			28.5	40	29	121	30.4	40	31	123
	460–3–60	DD–STD	0.25	1.0	14.9	20	15	49	15.9	20	16	50
		MED			13.0	15	13	51	14.0	20	14	52
		HIGH			13.5	20	14	60	14.5	20	15	61
	575–3–60	DD–STD	0.24	1.9	12.6	15	13	45	14.5	20	15	47
		MED			10.5	15	11	46	12.4	15	13	48
		HIGH			10.6	15	11	52	12.5	15	13	54
06	208/230–1–60	DD–STD	0.48	1.9	44.9	60	44	149	46.8	60	47	151
	208/230–3–60	DD–STD	0.48	1.9	33.5	45	34	125	35.4	50	36	127
		MED			31.3	45	31	148	33.2	45	34	150
		HIGH			33.6	45	34	174	35.5	50	36	176
	460–3–60	DD–STD	0.25	1.0	15.9	20	16	60	16.9	20	17	61
		MED			14.5	20	15	71	15.5	20	16	72
		HIGH			15.3	20	16	84	16.3	20	17	85
	575–3–60	DD–STD	0.24	1.9	13.0	15	13	48	14.9	20	16	50
		MED			11.0	15	11	55	12.9	15	13	57
		HIGH			11.8	15	12	66	13.7	15	14	68

MCA/MOCP (CON'T)

TABLE 46 – MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O.-6-8.5 TON

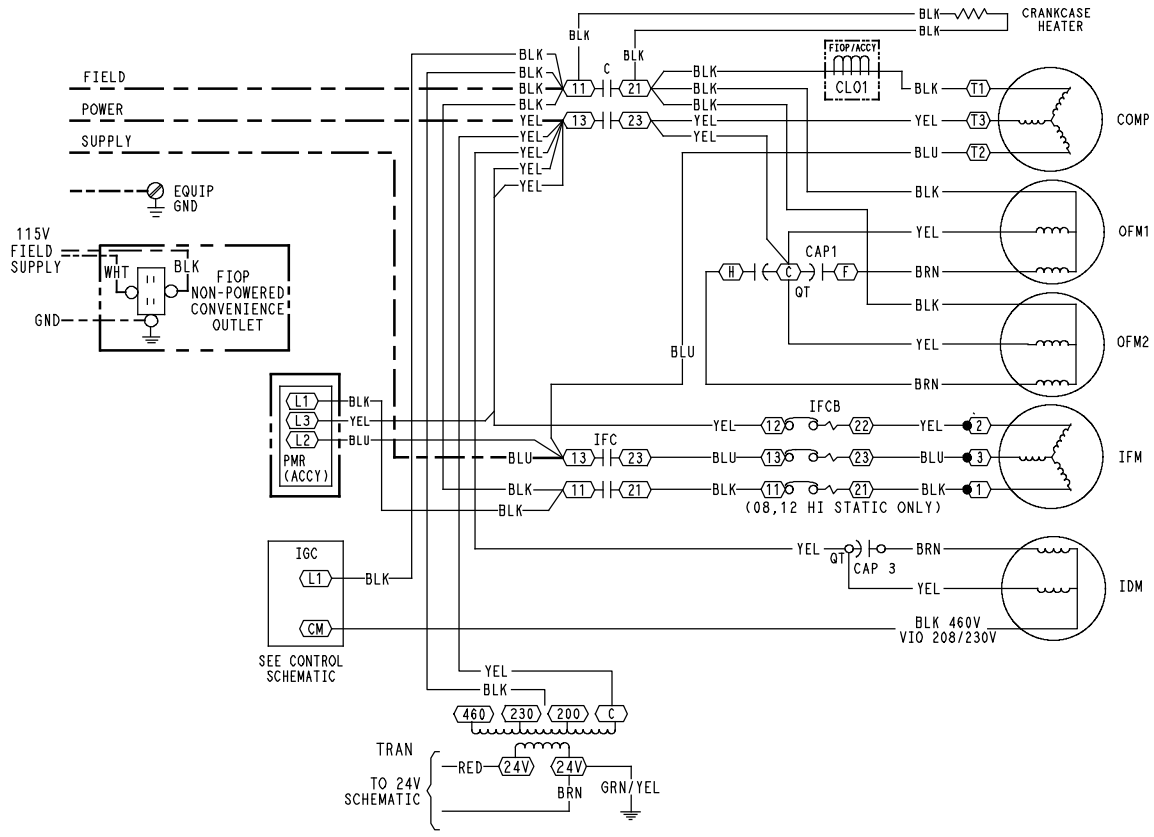
UNIT	V–Ph–Hz	IFM	COMBUST FAN MOTOR	PWR EXHAUST	NO C.O. or UNPWR C.O.							
					NO P.E.				w/ P.E. (pwrd fr/ unit)			
		TYPE	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
							FLA	LRA			FLA	LRA
07	208/230–3–60	STD	0.48	3.8	32.0	50	31	148	35.8	50	36	152
		MED			34.3	50	34	185	38.1	50	38	189
		HIGH			41.8	60	43	211	45.6	60	47	215
	460–3–60	STD	0.25	1.8	16.3	25	16	75	18.1	25	18	77
		MED			17.1	25	17	94	18.9	25	19	96
		HIGH			21.1	30	22	107	22.9	30	24	109
	575–3–60	STD	0.24	3.8	12.9	20	13	61	16.7	20	17	65
		MED			13.3	20	13	76	17.1	20	17	80
		HIGH			16.1	20	16	90	19.9	25	21	94
08 (2–stage cool)	208/230–3–60	STD	0.48	3.8	38.8	50	41	191	42.6	50	45	195
		MED			38.8	50	41	202	42.6	50	45	206
		HIGH			43.6	50	46	245	47.4	60	51	249
	460–3–60	STD	0.25	1.8	17.9	20	19	95	19.7	25	21	97
		MED			17.9	20	19	101	19.7	25	21	103
		HIGH			19.7	25	21	123	21.5	25	23	125
	575–3–60	STD	0.24	3.8	13.1	15	14	77	16.9	20	18	81
		MED			12.7	15	13	81	16.5	20	18	85
		HIGH			13.5	15	14	92	17.3	20	19	96
09 (2–stage cool)	208/230–3–60	STD	0.48	3.8	39.0	50	41	191	42.8	50	45	195
		MED			39.0	50	41	202	42.8	50	45	206
		HIGH			43.8	50	46	245	47.6	60	51	249
	460–3–60	STD	0.25	1.8	18.2	20	19	95	20.0	25	21	97
		MED			18.2	20	19	101	20.0	25	21	103
		HIGH			20.0	25	21	123	21.8	25	23	125
	575–3–60	STD	0.24	3.8	14.4	20	15	77	18.2	20	20	81
		MED			14.0	20	15	81	17.8	20	19	85
		HIGH			14.8	20	16	92	18.6	20	20	96

MCA/MOCP (CON'T)

TABLE 47 – MCA/MOCP DETERMINATION WITH POWERED CONVENIENCE OUTLET.-6-8.5 TON

UNIT	V–Ph–Hz	IFM	COMBUST FAN MOTOR	PWR EXHAUST	w/ PWRD C.O.							
					NO P.E.				w/ P.E. (pwrd fr/ unit)			
		TYPE	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
							FLA	LRA			FLA	LRA
07	208/ 230–3–60	STD	0.48	3.8	36.8	50	37	153	40.6	50	41	157
		MED			39.1	50	39	190	42.9	60	44	194
		HIGH			46.6	60	48	216	50.4	60	52	220
	460–3–60	STD	0.25	1.8	18.5	25	19	77	20.3	30	21	79
		MED			19.3	25	19	96	21.1	30	22	98
		HIGH			23.3	30	24	109	25.1	30	26	111
	575–3–60	STD	0.24	3.8	14.6	20	15	63	18.4	25	19	67
		MED			15.0	20	15	78	18.8	25	19	82
		HIGH			17.8	25	18	92	21.6	25	23	96
08 (2–stage cool)	208/ 230–3–60	STD	0.48	3.8	43.6	50	46	196	47.4	60	51	200
		MED			43.6	50	46	207	47.4	60	51	211
		HIGH			48.4	60	52	250	52.2	60	56	254
	460–3–60	STD	0.25	1.8	20.1	25	21	97	21.9	25	23	99
		MED			20.1	25	21	103	21.9	25	23	105
		HIGH			21.9	25	23	125	23.7	30	26	127
	575–3–60	STD	0.24	3.8	14.8	20	16	79	18.6	20	20	83
		MED			14.4	20	15	83	18.2	20	20	87
		HIGH			15.2	20	16	94	19.0	25	21	98
09 (2–stage cool)	208/ 230–3–60	STD	0.48	3.8	43.8	50	46	196	47.6	60	51	200
		MED			43.8	50	46	207	47.6	60	51	211
		HIGH			48.6	60	52	250	52.4	60	56	254
	460–3–60	STD	0.25	1.8	20.4	25	22	97	22.2	25	24	99
		MED			20.4	25	22	103	22.2	25	24	105
		HIGH			22.2	25	24	125	24.0	30	26	127
	575–3–60	STD	0.24	3.8	16.1	20	17	79	19.9	25	22	83
		MED			15.7	20	17	83	19.5	25	21	87
		HIGH			16.5	20	18	94	20.3	25	22	98

TYPICAL WIRING DIAGRAMS



LEGEND

- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- SPLICE
- SPLICE (MARKED)
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR OPTIONAL WIRING
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
COMP	COMPRESSOR MOTOR
DDC	DIRECT DIGITAL CONTROL
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
GVR	GAS VALVE RELAY
HPS	HIGH PRESSURE SWITCH
HS	HALL EFFECT SENSOR
I	IGNITOR
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IGC	INTEGRATED GAS CONTROL
IRH	INDOOR RELATIVE HUMIDITY
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
MGV	MAIN GAS VALVE
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
RS	ROLLOUT SWITCH
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER

NOTES
1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. 208/230V UNIT TRAN IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD, ALUMINUM OR ALUMINUM CONNECTORS.
5. USE COPPER CONDUCTOR ONLY.

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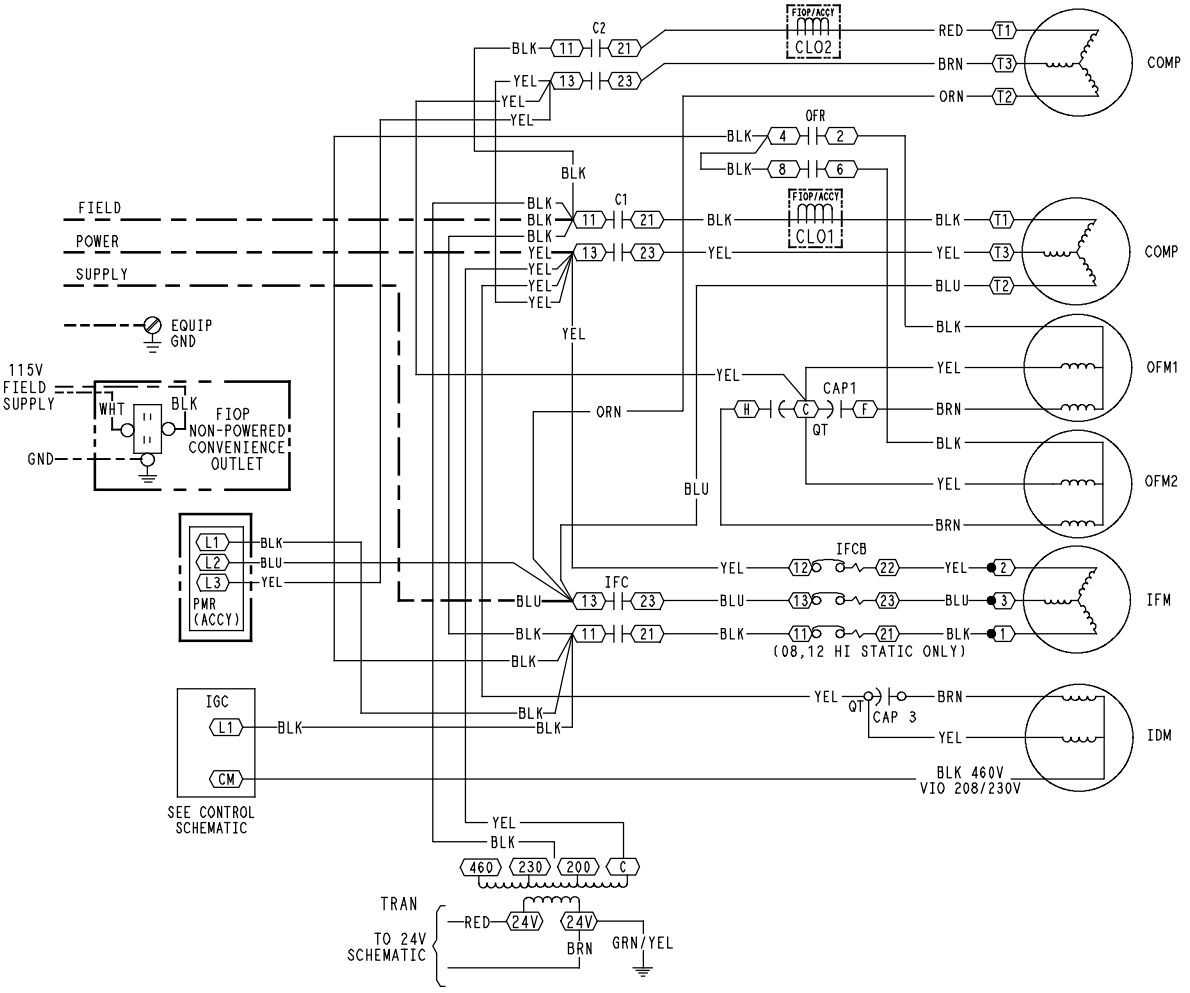
Fig. 15 - 1-Stage Cooling Typical Power Diagram

TYPICAL WIRING DIAGRAMS (cont.)



LEGEND

- MARKED WIRE
- TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- TERMINAL BLOCK
- SPLICE
- SPLICE (MARKED)
- FACTORY WIRING
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- CIRCUIT BOARD TRACE
- ACCESSORY OR OPTIONAL WIRING
- TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

NOTES

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. 208/230V UNIT TRAN IS WIRED FOR 230V UNIT. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP.
4. USE COPPER, COPPER CLAD, ALUMINUM OR ALUMINUM CONNECTORS.
5. USE COPPER CONDUCTOR ONLY.

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CCN	CARRIER COMFORT NETWORK
CMP SAFE	COMPRESSOR SAFFETY
CLO	COMPRESSOR LOCKOUT
COMP	COMPRESSOR MOTOR
DDC	DIRECT DIGITAL CONTROL
FSD	FIRE SHUT DOWN
FS	FLAME SENSOR
FU	FUSE
GND	GROUND
GVR	GAS VALVE RELAY
HPS	HIGH PRESSURE SWITCH
HS	HALL EFFECT SENSOR
I	IGNITOR
IAQ	INDOOR AIR QUALITY SENSORS
IDM	INDUCED DRAFT MOTOR
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IGC	INTEGRATED GAS CONTROL
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LS	LIMIT SWITCH
MGV	MAIN GAS VALVE
OFR	OUTDOOR FAN RELAY
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
RS	ROLLOUT SWITCH
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER

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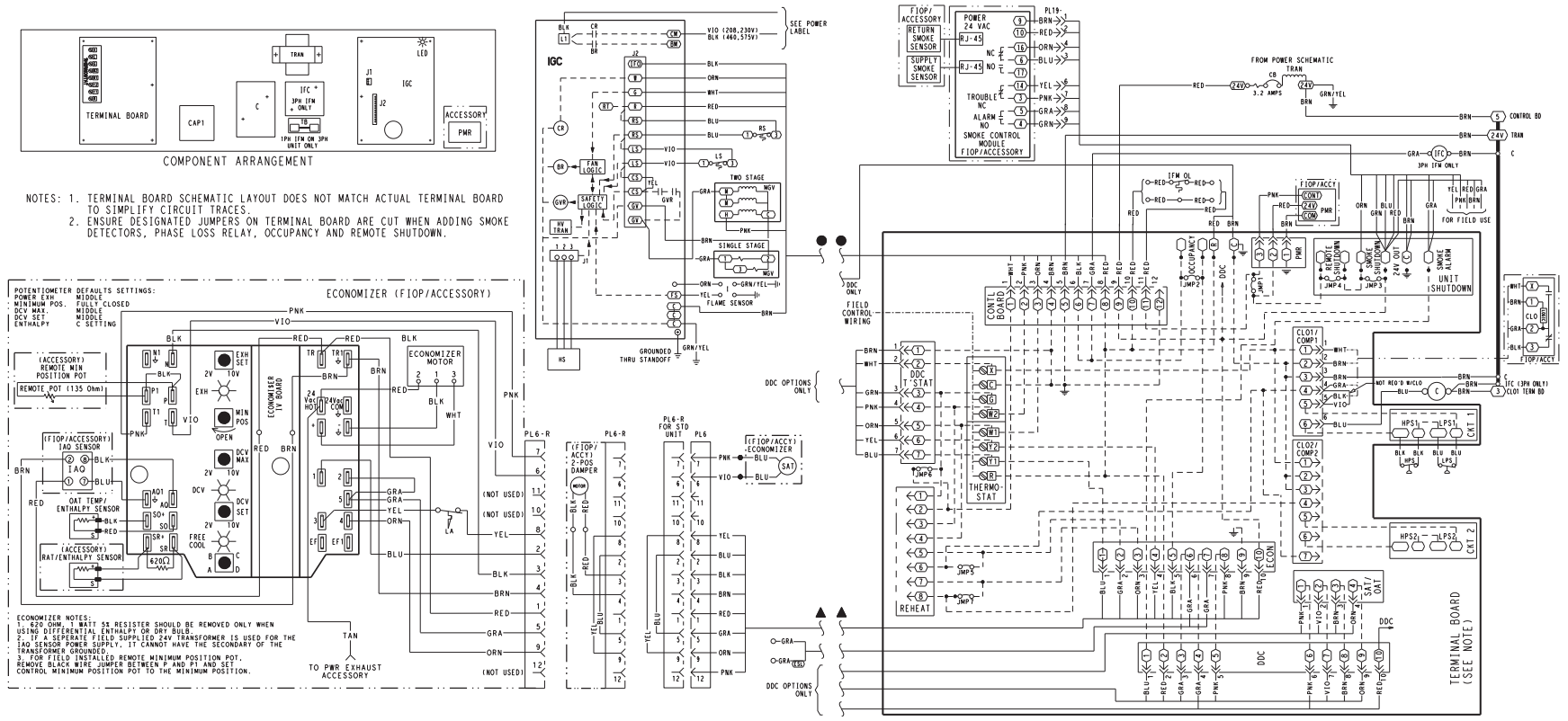
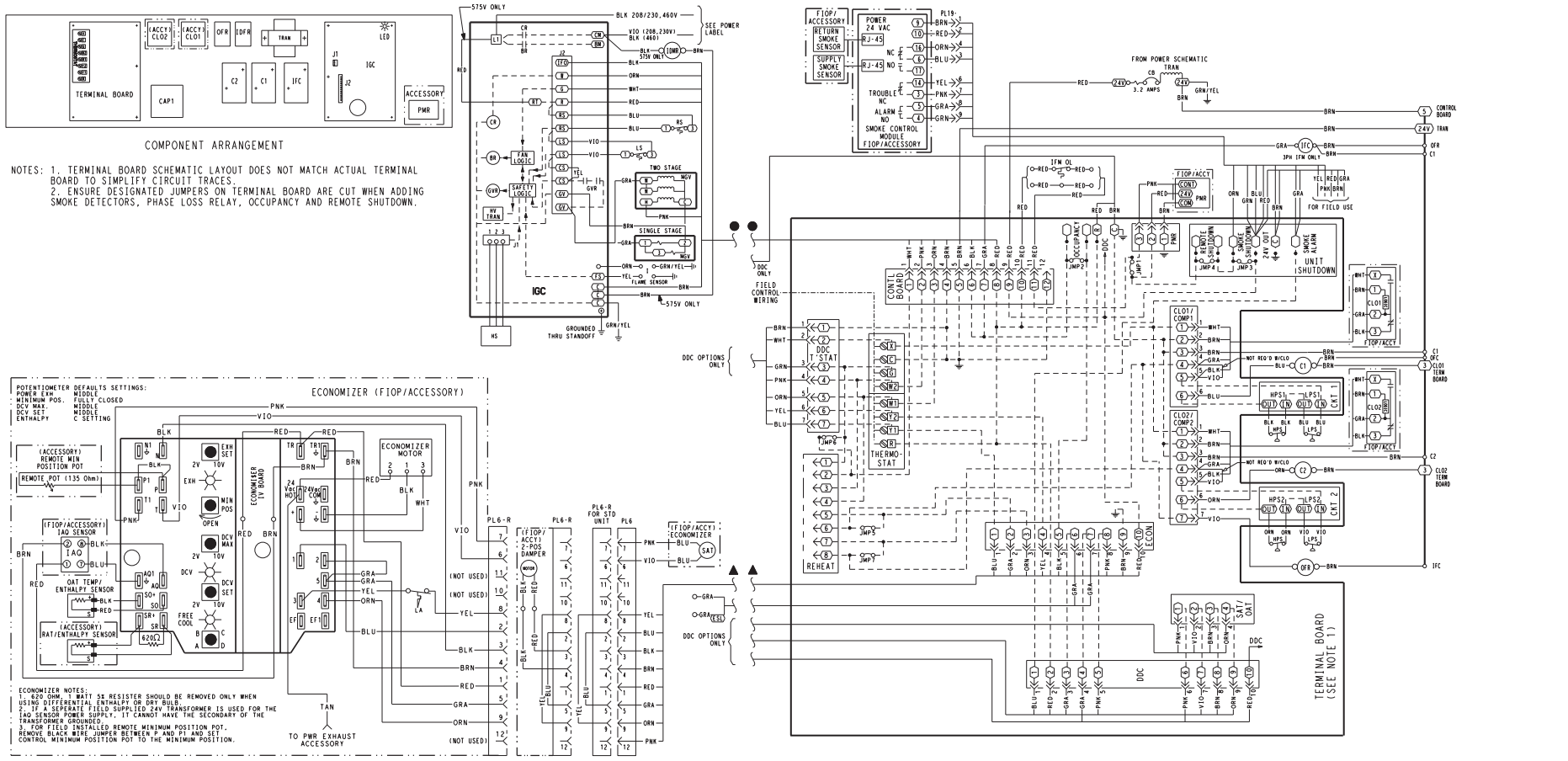
Fig. 16 – 2-Stage Cooling Typical Power Diagram


COMPONENT ARRANGEMENT
NOTES: 1. TERMINAL BOARD SCHEMATIC LAYOUT DOES NOT MATCH ACTUAL TERMINAL BOARD TO SIMPLIFY CIRCUIT TRACES.
2. ENSURE DESIGNATED JUMPERS ON TERMINAL BOARD ARE CUT WHEN ADDING SMOKE DETECTORS, PHASE LOSS RELAY, OCCUPANCY AND REMOTE SHUTDOWN.
ECONOMIZER (FIOP/ACCESSORY)
IGC
TWO STAGE
SINGLE STAGE
DDC ONLY
FIELD CONTROL WIRING
DDC OPTIONS ONLY
THERMO-STAT
UNIT SHUTDOWN
TERMINAL BOARD (SEE NOTE)
ECONOMIZER NOTES:
1. 620 OHM, 1 WATT 5% RESISTER SHOULD BE REMOVED ONLY WHEN USING DIFFERENTIAL ENTHALPY OR DRY BULB.
2. IF A SEPERATE FIELD SUPPLIED 24V TRANSFORMER IS USED FOR THE IAQ SENSOR POWER SUPPLY, IT CANNOT HAVE THE SECONDARY OF THE TRANSFORMER GROUNDED.
3. FOR FIELD INSTALLED REMOTE MINIMUM POSITION POT, REMOVE BLACK WIRE JUMPER BETWEEN P AND P1 AND SET CONTROL MINIMUM POSITION POT TO THE MINIMUM POSITION.

C08524

Fig. 17 – 1-Stage Typical Wiring Diagram


COMPONENT ARRANGEMENT
NOTES: 1. TERMINAL BOARD SCHEMATIC LAYOUT DOES NOT MATCH ACTUAL TERMINAL BOARD TO SIMPLIFY CIRCUIT TRACES.
2. ENSURE DESIGNATED JUMPERS ON TERMINAL BOARD ARE CUT WHEN ADDING SMOKE DETECTORS, PHASE LOSS RELAY, OCCUPANCY AND REMOTE SHUTDOWN.
ECONOMIZER (FIOP/ACCESSORY)
IGC
TERMINAL BOARD (SEE NOTE 1)
UNIT SHUTDOWN
THERMO-STAT
DDC T'STAT
FIELD CONTROL WIRING
FROM POWER SCHEMATIC
TRAN
TO PWR EXHAUST ACCESSORY

C08578

Fig. 18 – 2-Stage Typical Wiring Diagram

SEQUENCE OF OPERATION

General

The sequence below describes the sequence of operation for an electro-mechanical unit with and without a factory installed EconoMi$er™ IV (called "economizer" in this sequence). For information regarding a direct digital controller, see the start-up, operations, and troubleshooting manual for the applicable controller.

Electro-mechanical units with no economizer

Cooling —

When the thermostat calls for cooling, terminals G and Y1 are energized. As a result, the indoor-fan contactor (IFC) and the compressor contactor (C1) are energized, causing the indoor-an motor (IFM), compressor #1, and outdoor fan to start. If the unit has 2 stages of cooling, the thermostat will additionally energize Y2. The Y2 signal will energize compressor contactor #2 (C2), causing compressor #2 to start. Regardless of the number of stages, the outdoor-fan motor runs continuously while unit is cooling.

Heating

NOTE: Preferred Series™ (581J) units have either 1 or 2 stages of gas heat.

When the thermostat calls for heating, power is sent to W on the Integrated Gas Controller (IGC) board. An LED (light-emitting diode) on the IGC board turns on and remains on during normal operation. A check is made to ensure that the rollout switch and limit switch are closed. If the check was successful, the induced-draft motor is energized, and when its speed is satisfactory, as proven by the "hall effect" sensor, the ignition activation period begins. The burners will ignite within 5 seconds. If the burners do not light, there is a 22-second delay before another 5-second attempt. This sequence is repeated for 15 minutes or until the burners light. If, after the 15 minutes, the burners still have not lit, heating is locked out. To reset the control, break 24-v power to the thermostat.

When ignition occurs, the IGC board will continue to monitor the condition of the rollout switch, the limit switches, the "hall effect" sensor, as well as the flame sensor. 45 seconds after ignition occurs, assuming the unit is controlled through a room thermostat set for fan auto, the indoor-fan motor will energize (and the outdoor-air dampers will open to their minimum position). If, for some reason, the over-temperature limit opens prior to the start of the indoor fan blower, the unit will shorten the 45-second delay to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once the fan-on delay has been modified, it will not change back to 45 seconds until power is reset to the control.

On units with 2 stages of heat, when additional heat is required, W2 closes and initiates power to the second stage of the main gas valve. When the thermostat is satisfied, W1 and W2 open and the gas valve closes, interrupting the flow of gas to the main burners.

If the call for W1 lasted less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is controlled through a room thermostat set for fan auto, the indoor-fan motor will continue to operate for an additional 45 seconds then stop. If the over-temperature limit opens after the indoor motor is stopped, but within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control. A LED indicator is provided on the IGC to monitor operation.

Electro-mechanical units with an economizer

Cooling —

When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi$er IV control to provide a 50°F (10°C) to 55°F (13°C) mixed-air temperature into the zone. As the mixed air temperature fluctuates above 55°F (13°C) or below 50°F (10°C) dampers will be modulated (open or close) to bring the mixed-air temperature back within control. If mechanical cooling is utilized with free cooling, the outdoor-air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed-air temperature to drop below 45°F (7°C), then the outdoor-air damper position will be decreased to the minimum position. If the mixed-air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed-air temperature rises above 48°F (9°C). The power exhaust fans will be energized and de-energized, if installed, as the outdoor-air damper opens and closes.

If field-installed accessory CO_2 sensors are connected to the EconoMi$er IV control, a demand controlled ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 setpoint, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed. For EconoMi$er IV operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

When the EconoMi$er IV control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi$er IV damper to the minimum position.

SEQUENCE OF OPERATION (cont.)

On the initial power to the EconoMi$er IV control, it will take the damper up to 2 1/2 minutes before it begins to position itself. After the initial power-up, further changes in damper position can take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1 1/2 and 2 1/2 minutes. If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed-air temperature setpoint at 50°F (10°C) to 55°F (13°C). If there is a further demand for cooling (cooling second stage - Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed-air temperature setpoint. The EconoMi$er IV damper will be open at maximum position. EconoMi$er IV operation is limited to a single compressor.

Heating

The sequence of operation for the heating is the same as an electromechanical unit with no economizer. The only difference is how the economizer acts. The economizer will stay at the Economizer Minimum Position while the evaporator fan is operating. The outdoor-air damper is closed when the indoor fan is not operating.

GUIDE SPECIFICATIONS - 581J*04-09

Note about this specification:

This specification is in the "Masterformat" as published by the Construction Specification Institute. Please feel free to copy this specification directly into your building spec.

Gas Heat/Electric Cooling Packaged Rooftop

HVAC Guide Specifications

Size Range: **3 to 8.5 Nominal Tons**

Puron
the environmentally sound refrigerant

Section **Description**

23 06 80 Schedules for Decentralized HVAC Equipment

23 06 80.13 Decentralized Unitary HVAC Equipment Schedule

23 06 80.13.A. Rooftop unit schedule

1. Schedule is per the project specification requirements.

23 07 16 HVAC Equipment Insulation

23 07 16.13 Decentralized, Rooftop Units:

23 07 16.13.A. Evaporator fan compartment:

1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1 1/2 lb density, flexible fiberglass insulation bonded with a phenolic binder, neoprene coated on the air side.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

23 07 16.13.B. Gas heat compartment:

1. Aluminum foil-faced fiberglass insulation shall be used.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

23 09 13 Instrumentation and Control Devices for HVAC

23 09 13.23 Sensors and Transmitters

23 09 13.23.A. Thermostats

1. Thermostat must
   a. energize both "W" and "G" when calling for heat.
   b. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
   c. include capability for occupancy scheduling.

23 09 23 Direct-digital Control system for HVAC

23 09 23.13 Decentralized, Rooftop Units:

23 09 23.13.A. NA

1. Shall be ASHRAE 62-2001 compliant.
2. Shall accept 18-32 VAC input power.
3. Shall have an operating temperature range from -40°F (-40°C) to 158°F (70°C), 10% - 95% RH (non-condensing).
4. Shall include an integrated economizer controller to support an economizer with 4 to 20 mA actuator input and no microprocessor controller.
5. Controller shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, indoor relative humidity, compressor lock-out, fire shutdown, enthalpy, fan status, remote time clock/door switch.
6. Shall accept a CO_2 sensor in the conditioned space, and be Demand Control Ventilation (DCV) ready.
7. Shall provide the following outputs: economizer, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, heat stage 3/ exhaust/ reversing valve/ dehumidify/ occupied.
8. Unit shall provide surge protection for the controller through a circuit breaker.
9. Shall be Internet capable, and communicate at a Baud rate of 38.4K or faster
10. Shall have an LED display independently showing the status of activity on the communication bus, and processor operation.

11. Shall include an EIA-485 protocol communication port, an access port for connection of either a computer or a Bryant technician tool, an EIA-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks plug-in communications card.
12. Shall have built-in support for Bryant technician tool.
13. Software upgrades will be accomplished by local download. Software upgrades through chip replacements are not allowed.
14. Shall be shock resistant in all planes to 5G peak, 11ms during operation, and 100G peak, 11ms during storage.
15. Shall be vibration resistant in all planes to 1.5G @ 20-300 Hz.
16. Shall support a bus length of 4000 ft (1219m) max, 60 devices per 1000 ft (305m) section, and 1 RS-485 repeater per 1000 ft (305m) sections.

23 09 23.13.B. RTU-MP - Open protocol, direct digital controller:

1. Shall be ASHRAE 62-2001 compliant.
2. Shall accept 18-30VAC, 50-60Hz, and consumer 15VA or less power.
3. Shall have an operating temperature range from -40°F (-40°C) to 130°F (54°C), 10% - 90% RH (non-condensing).
4. Shall include built-in protocol for BACNET (MS/TP and PTP modes), Modbus (RTU and ASCII), Johnson N2 and LonWorks. LonWorks Echelon processor required for all Lon applications shall be contained in separate communication board.
5. Shall allow access of up to 62 network variables (SNVT). Shall be compatible with all open controllers
6. Baud rate Controller shall be selectable using a dipswitch.
7. Shall have an LED display independently showing the status of serial communication, running, errors, power, all digital outputs, and all analog inputs.
8. Shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, compressor lock-out, fire shutdown, enthalpy switch, and fan status/filter status/ humidity/ remote occupancy.
9. Shall provide the following outputs: economizer, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, heat stage 3/ exhaust/ reversing valve.
10. Shall have built-in surge protection circuitry through solid state polyswitches. Polyswitches shall be used on incoming power and network connections. Polyswitches will return to normal when the “trip” condition clears.
11. Shall have a battery back-up capable of a minimum of 10,000 hours of data and time clock retention during power outages.
12. Shall have built-in support for Bryant technician tool.
13. Shall include an EIA-485 protocol communication port, an access port for connection of either a computer or a Bryant technician tool, an EIA-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks communications card.
14. Software upgrades will be accomplished by either local or remote download. No software upgrades through chip replacements are allowed.

23 09 33 Electric and Electronic Control System for HVAC

23 09 33.13 Decentralized, Rooftop Units:

23 09 33.13.A. General:

1. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
2. Shall utilize color-coded wiring.
3. Shall include a central control terminal board to conveniently and safely provide connection points for vital control functions such as: smoke detectors, phase monitor, gas controller, economizer, thermostat, DDC control options, and low and high pressure switches.
4. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor. See heat exchanger section of this specification.
5. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.

23 09 33.23.B. Safeties:

1. Compressor over-temperature, over-current. High internal pressure differential.
2. Low-pressure switch.
   a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 low and high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
   b. Low pressure switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.

3. High-pressure switch.
   a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 low and high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
   b. High pressure switch shall use different color wire than the low pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
4. Automatic reset, motor thermal overload protector.
5. Heating section shall be provided with the following minimum protections:
   a. High-temperature limit switches.
   b. Induced draft motor speed sensor.
   c. Flame rollout switch.
   d. Flame proving controls.

23 09 93 Sequence of Operations for HVAC Controls

23 09 93.13 Decentralized, Rooftop Units:

23 09 93.13 INSERT SEQUENCE OF OPERATION

23 40 13 Panel Air Filters

23 40 13.13 Decentralized, Rooftop Units:

23 40 13.13.A. Standard filter section

1. Shall consist of factory-installed, low velocity, disposable 2-in. thick fiberglass filters of commercially available sizes.
2. Unit shall use only one filter size. Multiple sizes are not acceptable.
3. Filters shall be accessible through an access panel with "no-tool" removal as described in the unit cabinet section of this specification (23 81 19.13.H).

23 81 19 Self-Contained Air Conditioners

23 81 19.13 Small-Capacity Self-Contained Air Conditioners (581J*04-09)

23 81 19.13.A. General

1. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing a fully hermetic scroll compressor(s) for cooling duty and gas combustion for heating duty.
2. Factory assembled, single-piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
3. Unit shall use environmentally sound, Puron® refrigerant.
4. Unit shall be installed in accordance with the manufacturer's instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.

23 81 19.13.B. Quality Assurance

1. Unit meets ASHRAE 90.1-2007 minimum efficiency requirements.
2. 3 phase units are Energy Star certified.
3. Unit shall be rated in accordance with AHRI Standards 210/240 and 340/360.
4. Unit shall be designed to conform to ASHRAE 15, 2001.
5. Unit shall be UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.
6. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
7. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
8. Unit casing shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 5000-hour salt spray.
9. Unit shall be designed in accordance with ISO 9001:2008, and shall be manufactured in a facility registered by ISO 9001:2008.
10. Roof curb shall be designed to conform to NRCA Standards.
11. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
12. Unit shall be designed in accordance with UL Standard 1995, including tested to withstand rain.
13. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
14. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.

23 81 19.13.C. Delivery, Storage, and Handling

1. Unit shall be stored and handled per manufacturer's recommendations.
2. Lifted by crane requires either shipping top panel or spreader bars.
3. Unit shall only be stored or positioned in the upright position.

23 81 19.13.E. Project Conditions

1. As specified in the contract.

23 81 19.13.F. Operating Characteristics

1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 210/240 or 360 at ± 10% voltage.
2. Compressor with standard controls shall be capable of operation down to 35°F (2°C), ambient outdoor temperatures. Accessory low ambient kits shall be available if operation below 35°F (2°C), is required. See below for head pressure control package or winter start kit.
3. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.
4. Unit shall be factory configured for vertical supply & return configurations.
5. Unit shall be field convertible from vertical to horizontal configuration without the use of special conversion kits.
6. Unit shall be capable of mixed operation: vertical supply with horizontal return or horizontal supply with vertical return.

23 81 19.13.G. Electrical Requirements

1. Main power supply voltage, phase, and frequency must match those required by the manufacturer.

23 81 19.13.H. Unit Cabinet

1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a pre-painted baked enamel finish on all externally exposed surfaces.
2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F / 16°C): 60, Hardness: H-2H Pencil hardness.
3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 210/240 or 340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the gas heat compartment.
4. Base of unit shall have a minimum of four locations for thru-the-base gas and electrical connections (factory installed or field installed), standard.
5. Base Rail
   a. Unit shall have base rails on a minimum of 4 sides.
   b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
   c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
   d. Base rail shall be a minimum of 16 gauge thickness.
6. Condensate pan and connections:
   a. Shall be an internally sloped condensate drain pan made of a non-corrosive material.
   b. Shall comply with ASHRAE Standard 62.
   c. Shall use a 3/4" -14 NPT drain connection, possible either through the bottom or side of the drain pan. Connection shall be made per manufacturer's recommendations.
7. Top panel:
   a. Shall be a single piece top panel on 04 thru 09 sizes.
8. Gas Connections:
   a. All gas piping connecting to unit gas valve shall enter the unit cabinet at a single location on side of unit (horizontal plane).
   b. Thru-the-base capability
      (1.) Standard unit shall have a thru-the-base gas-line location using a raised, embossed portion of the unit basepan.
      (2.) Optional, factory-approved, water-tight connection method must be used for thru-the-base gas connections.
      (3.) No basepan penetration, other than those authorized by the manufacturer, is permitted.
9. Electrical Connections
   a. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
   b. Thru-the-base capability.
      (1.) Standard unit shall have a thru-the-base electrical location(s) using a raised, embossed portion of the unit basepan.

(2.) Optional, factory-approved, water-tight connection method must be used for thru-the-base electrical connections.

(3.) No basepan penetration, other than those authorized by the manufacturer, is permitted.

10. Component access panels (standard)
    a. Cabinet panels shall be easily removable for servicing.
    b. Unit shall have one factory installed, tool-less, removable, filter access panel.
    c. Panels covering control box, indoor fan, indoor fan motor, gas components (where applicable), and compressors shall have a molded composite handles.
    d. Handles shall be UV modified, composite. They shall be permanently attached, and recessed into the panel.
    e. Screws on the vertical portion of all removable access panel shall engage into heat resistant, molded composite collars.
    f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

23 81 19.13.I. Gas Heat

1. General
    a. Heat exchanger shall be an induced draft design. Positive pressure heat exchanger designs shall not be allowed.
    b. Shall incorporate a direct-spark ignition system and redundant main gas valve.
    c. Gas supply pressure at the inlet to the rooftop unit gas valve must match that required by the manufacturer.
2. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor.
    a. IGC board shall notify users of fault using an LED (light-emitting diode).
    b. The LED shall be visible without removing the control box access panel.
    c. IGC board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high temperature limit switch.
    d. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high temperature limit switch. Fault indication shall be made using an LED.
3. Standard Heat Exchanger construction
    a. Heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gauge steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.
    b. Burners shall be of the in-shot type constructed of aluminum-coated steel.
    c. Burners shall incorporate orifices for rated heat output up to 2000 ft (610m) elevation. Additional accessory kits may be required for applications above 2000 ft (610m) elevation, depending on local gas supply conditions.
    d. Each heat exchanger tube shall contain multiple dimples for increased heating effectiveness.
4. Optional Stainless Steel Heat Exchanger construction
    a. Use energy saving, direct-spark ignition system.
    b. Use a redundant main gas valve.
    c. Burners shall be of the in-shot type constructed of aluminum-coated steel.
    d. All gas piping shall enter the unit cabinet at a single location on side of unit (horizontal plane).
    e. The optional stainless steel heat exchanger shall be of the tubular-section type, constructed of a minimum of 20-gauge type 409 stainless steel.
    f. Type 409 stainless steel shall be used in heat exchanger tubes and vestibule plate.
    g. Complete stainless steel heat exchanger allows for greater application flexibility.
5. Optional Low NO_x Heat Exchanger construction
    a. Low NO_x reduction shall be provided to reduce nitrous oxide emissions to meet California's Air Quality Management District (SCAQMD) low-NO_x emissions requirement of 40 nanograms per joule or less.
    b. Primary tubes and vestibule plates on low NO_x units shall be 409 stainless steel. Other components shall be aluminized steel.
6. Induced draft combustion motor and blower
    a. Shall be a direct-drive, single inlet, forward-curved centrifugal type.
    b. Shall be made from steel with a corrosion-resistant finish.
    c. Shall have permanently lubricated sealed bearings.
    d. Shall have inherent thermal overload protection.
    e. Shall have an automatic reset feature.

23 81 19.13.J. Coils

1. Standard Aluminum Fin/Copper Tube Coils:
   a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
   b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
   c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
2. Optional Pre-coated aluminum-fin condenser coils:
   a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.
   b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.
   c. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
3. Optional Copper-fin evaporator and condenser coils:
   a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
   b. Galvanized steel tube sheets shall not be acceptable.
   c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
4. Optional E-coated aluminum-fin evaporator and condenser coils:
   a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
   b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
   c. Color shall be high gloss black with gloss per ASTM D523-89.
   d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
   e. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.
   f. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
   g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92).
   h. Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.
5. Optional E-coated aluminum-fin, aluminum tube condenser coils:
   a. Shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers.
   b. Coating process shall ensure complete coil encapsulation, including all exposed fin edges.
   c. E-coat thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to 2.0 mil on all external coil surface areas, including fin edges, shall be provided.
   d. Shall have superior hardness characteristics of 2H per ASTM D3363-00 and cross-hatch adhesion of 4B-5B per ASTM D3359-02.
   e. Shall have superior impact resistance with no cracking, chipping or peeling per NSF/ANSI 51-2002 Method 10.2.

23 81 19.13.K. Refrigerant Components

1. Refrigerant circuit shall include the following control, safety, and maintenance features:
   a. Thermostatic Expansion Valve (TXV) shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
   b. Refrigerant filter drier - Solid core design.
   c. Service gauge connections on suction and discharge lines.
   d. Pressure gauge access through a specially designed access port in the top panel of the unit.
2. There shall be gauge line access port in the skin of the rooftop, covered by a black, removable plug.
   a. The plug shall be easy to remove and replace.
   b. When the plug is removed, the gauge access port shall enable maintenance personnel to route their pressure gauge lines.
   c. This gauge access port shall facilitate correct and accurate condenser pressure readings by enabling the reading with the compressor access panel on.

d. The plug shall be made of a leak proof, UV-resistant, composite material.

3. Compressors
   a. Unit shall use fully hermetic, scroll compressor for each independent refrigeration circuit.
   b. Models shall be available with single compressor/single stage cooling designs on 04 – 07 sizes models, and 2 compressor/2 stage cooling models on 08 – 09 sizes.
   c. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
   d. Compressors shall be internally protected from high discharge temperature conditions.
   e. Compressors shall be protected from an over-temperature and over-amperage conditions by an internal, motor overload device.
   f. Compressor shall be factory mounted on rubber grommets.
   g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
   h. Crankcase heaters shall not be required for normal operating range, unless provided by the factory.

23 81 19.13.L. Filter Section

1. Filters access is specified in the unit cabinet section of this specification.
2. Filters shall be held in place by a pivoting filter tray, facilitating easy removal and installation.
3. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.
4. Filters shall be standard, commercially available sizes.
5. Only one size filter per unit is allowed.

23 81 19.13.M. Evaporator Fan and Motor

1. Evaporator fan motor:
   a. Shall have permanently lubricated bearings.
   b. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
   c. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.
2. Electric Drive (Direct Drive) X13 – 5 Speed/Torque Evaporator Fan:
   a. Multi speed motor with easy quick adjustment settings.
   b. Blower fan shall be double-inlet type with forward-curved blades.
   c. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
   d. Standard on all 04-06 models with 208/230/1/60 operation
   e. Standard on all 04-06 3-phase models, with optional belt drive.
3. Belt-driven Evaporator Fan:
   a. Belt drive shall include an adjustable-pitch motor pulley.
   b. Shall use sealed, permanently lubricated ball-bearing type.
   c. Blower fan shall be double-inlet type with forward-curved blades.
   d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
   e. Standard on all 07-09 size models. Optional on all 04-06 3-phase models.

23 81 19.13.N. Condenser Fans and Motors

1. Condenser fan motors:
   a. Shall be a totally enclosed motor.
   b. Shall use permanently lubricated bearings.
   c. Shall have inherent thermal overload protection with an automatic reset feature.
   d. Shall use a shaft-down design on 04 to 09 models.
2. Condenser Fans:
   a. Shall be a direct-driven propeller type fan.
   b. Shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.

23 81 19.13.O. Special Features Options and Accessories

1. Integrated Economizers:
   a. Integrated, gear-driven parallel modulating blade design type capable of simultaneous economizer and compressor operation.
   b. Independent modules for vertical or horizontal return configurations shall be available. Vertical return modules shall be available as a factory installed option.
   c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.

d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.

e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.

f. Shall be equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.

g. Shall be capable of introducing up to 100% outdoor air.

h. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air.

i. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.

j. Dry bulb outdoor-air temperature sensor shall be provided as standard. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F / 4 to 38°C. Additional sensor options shall be available as accessories.

k. The economizer controller shall also provide control of an accessory power exhaust unit. function. Factory set at 100%, with a range of 0% to 100%.

l. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy. A remote potentiometer may be used to override the damper setpoint.

m. Dampers shall be completely closed when the unit is in the unoccupied mode.

n. Economizer controller shall accept a 2-10Vdc CO_2 sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor-air damper to provide ventilation based on the sensor input.

o. Compressor lockout sensor shall open at 35°F (2°C) and close closes at 50°F (10°C).

p. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.

q. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.

2. Two-Position Damper

a. Damper shall be a Two-Position Damper. Damper travel shall be from the full closed position to the field adjustable %-open setpoint.

b. Damper shall include adjustable damper travel from 25% to 100% (full open).

c. Damper shall include single or dual blade, gear driven dampers and actuator motor.

d. Actuator shall be direct coupled to damper gear. No linkage arms or control rods shall be acceptable.

e. Damper will admit up to 100% outdoor air for applicable rooftop units.

f. Damper shall close upon indoor (evaporator) fan shutoff and/or loss of power.

g. The damper actuator shall plug into the rooftop unit's wiring harness plug. No hard wiring shall be required.

h. Outside air hood shall include aluminum water entrainment filter.

3. Manual damper

a. Manual damper package shall consist of damper, air inlet screen, and rain hood which can be preset to admit up to 25 or 50% outdoor air for year round ventilation.

4. Head Pressure Control Package

a. Controller shall control coil head pressure by condenser-fan speed modulation or condenser-fan cycling and wind baffles.

b. Shall consist of solid-state control and condenser-coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C)at outdoor ambient temperatures down to -20°F (-29°C).

5. Propane Conversion Kit

a. Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane, up to 2000 ft (610m) elevation.

b. Additional accessory kits may be required for applications above 2000 ft (610m) elevation.

6. Flue Shield

a. Flue shield shall provide protection from the hot sides of the gas flue hood.

7. Condenser Coil Hail Guard Assembly

a. Shall protect against damage from hail.

b. Shall be of louvered style.

8. Unit-Mounted, Non-Fused Disconnect Switch:

a. Switch shall be factory-installed, internally mounted.

b. National Electric Code (NEC) and UL approved non-fused switch shall provide unit power shutoff.

c. Shall be accessible from outside the unit.

d. Shall provide local shutdown and lockout capability.

9. Convenience Outlet:

a. Powered convenience outlet.
   (1.) Outlet shall be powered from main line power to the rooftop unit.
   (2.) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be UL certified and rated for additional outlet amperage.
   (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
   (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
   (5.) Voltage required to operate convenience outlet shall be provided by a factory-installed step-down transformer.
   (6.) Outlet shall be accessible from outside the unit.
   (7.) Outlet shall include a field-installed "Wet in Use" cover.

b. Non-Powered convenience outlet.
   (1.) Outlet shall be powered from a separate 115/120v power source.
   (2.) A transformer shall not be included.
   (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
   (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
   (5.) Outlet shall be accessible from outside the unit.
   (6.) Outlet shall include a field-installed "Wet in Use" cover.

10. Flue Discharge Deflector:
    a. Flue discharge deflector shall direct unit exhaust vertically instead of horizontally.
    b. Deflector shall be defined as a "natural draft" device by the National Fuel and Gas (NFG) code.
11. Thru-the-Base Connectors:
    a. Kits shall provide connectors to permit gas and electrical connections to be brought to the unit through the unit basepan.
    b. Minimum of four connection locations per unit.
12. Propeller Power Exhaust:
    a. Power exhaust shall be used in conjunction with an integrated economizer.
    b. Independent modules for vertical or horizontal return configurations shall be available.
    c. Horizontal power exhaust is shall be mounted in return ductwork.
    d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
13. Roof Curbs (Vertical):
    a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
    b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
    c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
14. High Altitude Gas Conversion Kit:
    a. Package shall contain all the necessary hardware and instructions to convert a standard natural gas unit to operate from 2000-7000 ft (610 to 2134m) elevation with natural gas or from 0-7000 ft (90-2134m) elevation with liquefied propane.
15. Outdoor Air Enthalpy Sensor:
    a. The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.
16. Return Air Enthalpy Sensor:
    a. The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.
17. Indoor Air Quality (CO_2) Sensor:
    a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
    b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The setpoint shall have adjustment capability.
18. Smoke detectors (factory-installed only):
    a. Shall be a Four-Wire Controller and Detector.
    b. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.
    c. Shall use magnet-activated test/reset sensor switches.

d. Shall have tool-less connection terminal access.
e. Shall have a recessed momentary switch for testing and resetting the detector.
f. Controller shall include:
(1.) One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
(2.) Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
(3.) One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
(4.) Capable of direct connection to two individual detector modules.
(5.) Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications

19. Winter start kit
a. Shall contain a bypass device around the low pressure switch.
b. Shall be required when mechanical cooling is required down to 25°F (-4°C).
c. Shall not be required to operate on an economizer when below an outdoor ambient of 40°F (4°C).

20. Time Guard
a. Shall prevent compressor short cycling by providing a 5-minute delay (±2 minutes) before restarting a compressor after shutdown for any reason.
b. One device shall be required per compressor.

21. Hinged Access Panels
a. Shall provide easy access through integrated quarter turn latches.
b. Shall be on major panels of – filter, control box, fan motor and compressor